Vol. XIII OCTOBER 1929 No 4

Entered as second-class matter January 12, 1924, at the post office at Río Piedras, Porto Rico, under the Act of June 6, 1900.
Acceptance for mailing at a special rate of postage provided for in section 1103, October 3, 1917, authorized January 12, 1924

THE JOURNAL

of the

DEPARTMENT OF AGRICULTURE

of **PORTO RICO**

MELVILLE T. COOK, Editor.

THE MIDDLE AMERICAN SPECIES OF THE GENUS INGA

By

HENRY PITTIER

PUBLISHED BY
THE INSULAR EXPERIMENT STATION
RIO PIEDRAS, P. R.

(ISSUED DECEMBER 1929)

San Juan, P. R., Bureau of Supplies, Printing, and Transportation, 1929

Pub.
Insular Exper. Sta.
2-21-1920

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The Journal of the Department of Agriculture
OF PORTO RICO

Published Quarterly: January, April, July and October of each year.
MELVILLE T. COOK, EDITOR

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THE MIDDLE AMERICAN SPECIES OF THE GENUS INGA

By HENRY PITTIER.

INTRODUCTION

In 1916, the writer published a "Preliminary Revision of the genus Inga [1], based mainly on the American collections at Harvard, New York, Chicago and the Donnell Smith Herbarium at Baltimore. In that paper, about forty new species or aberrant forms were described, bringing the number of known types up to 212. Since then, a relatively large number of new species have been described, so that the total may now reach about 250. This is not the place to discuss the recent creations, which, like several of my own, may prove later to lack a good foundation. This may happen especially when they belong to that wonderfully polymorphic group of the *Euingæ-Sulcatæ*, which are evidently still in full evolution and show the most unexpected variations in their characters. With regard to the Central-American new species, I will add that I have accepted them indiscriminately all but one, which was rejected for reasons which will appear at the corresponding place.

With reference to the nomenclature, it should be explained that, for brevity's sake, I have given only the name with priority's rights and made away altogether with the often cumbrous synonymy, which can easily be found elsewhere when really needed.

During the last three or four decades, a large number of Inga species have gradually acquired great importance as shade trees in coffee culture. In Costa Rica in particular, and in Central America generally, greater attention has been paid to the important question of sheltering the plantations against intense insolation as well as against the violence of the wind. A first, the natural shade of the

[1] Contr. U. S. Nat. Herb. 18: 167–224. 1916.

NOTE: This paper was written for the JOURNAL at the request of Hon. Carlos E. Chardón, Commissioner of Agriculture and Labor, Insular Government of Porto Rico.—*Editor.*

forest was considered as the ideal condition, until its many disadvantages became evident. Then shade was provided for by planting any kind of trees at the time when the coffee seedlings were put into the ground. At this stage of experimentation, it was noticed that the coffee shrub would not thrive in the close proximity of certain trees, either because of the shade not being adequate or on account of other contrary influences, while on the other hand, it assumed a prosperous aspect under the protection of other trees, these all belonging to the order *Leguminosæ*. The excellence of the shade alone could not, however, explain completely this favorable action, part of which was with reason attributed to the fact that the rootlets of most, if not all, Leguminous trees, are loaded with colonies of the famous bacterias discovered by Hellriegel and Willfarth, and act consequently as true nitrogen reserves, that element being further used for the continuous restoration of the soil. This property of the leguminous plants had long been known, though but as a part of the hereditary routine, to the farmers and even to the primitive Indians. Without knowing the reason why, the peasants of Central America had been aware for many generations, that any weed of the above-named family did benefit the soil, and among the primitive tribes acquainted with cacao, the custom was to have either some species of *Inga* or a tree of madre-de-cacao (*Gliricidia*) planted near every one of the cacao-trees scattered in the forest and under semi-cultivation.

In coffee and cacao culture, the first leguminous trees to enjoy the preference of the planters seem to have been species of *Erythrina*, some of which are still used to a large extent, outside of Central America especially. Their disadvantages, however, have little by little become evident: being almost always of very large dimensions, they are apt to exhaust the soil at the expense of the coffee shrub; their branches are too high to permit the regulation of the shade: many of them bear spines which are dangerous to the feet of the laborers; being deciduous they are entirely despoiled of their foliage, just at the time when the plantation is most in need of shade, and finally, as they grow old, they become more breakable and the fall of entire limbs brings havoc upon the coffee-trees. For all these and other reasons, the consensus of opinion among thinking planters has grown more and more adverse to the use of Erythrinas as shade trees, and their substitution by species of *Inga* has become more general. The trees of this genus are scattered all over Tropical America, but as it is in Central America and Mexico where the question of shade in coffee-culture has received the greater atten-

tion, the selection of the better-adapted species is also more advanced there, and the study of the species growing in that area of more importance. The object of this paper is mainly to give every coffee or cacao planter a good descriptive knowledge of these useful trees, and in another contribution which is now in preparation, the whole question of the shade and of the use of windbreakers will be discussed and the adaptability and convenience of each one and all the acceptable shade trees according to local conditions presented in the light of our present knowledge of the matter.

DEFINITION OF THE GENUS

INGA. Scop., Introd. 289. 1777.

Flowers pentamerous, calyx tubulous or campanulate, toothed, or short laciniate. Corolla tubulous or funnel-shaped, the petals adnate from the base to more than half their length (i. e. corolla gamopetalous). Stamens numerous, exserted, adnate on part of their length in a stamen tube. Ovary sessile or stipitate, with several or many ovules. Legume sessile or short-stipitate, straight or curved, flat, tetragonous or almost terete, usually with thickened sutures, indehiscent or hardly dehiscent, the seeds almost invariably surrounded with a white, sweet pulp. Trees or shrubs with pinnate leaves, the rachis of these oftentimes winged between and below the leaflets, sometimes wingless, and provided at the insertion of the leaflets with sessile or stipitate glands. Inflorescences umbellate, capitulate or spicate, single or clustered in the axils of the leaves or subpaniculate at the end of the branchlets. About 250 Neotropical species, of which 58 are spread over Middle-America.

SECTIONS AND SERIES OF INGA IN MIDDLE-AMERICA

Every section and series of Inga, as revised in the paper cited above, is represented in Middle-America, with the exception of series *Glabriflores* and *Lepanthæ* of section *Pseudinga*. These subdivisions may be distinguished by means of the following key:

KEY TO THE MIDDLE-AMERICAN SECTIONS OF GENUS INGA

Legume flat, the margins rounded, more or less thick, the sides mostly broad

Flowers distinctly and often long pedicellate, inserted on a very short receptacle and forming an umbellate inflorescence.

Sect. 1. LEPTINGA.

Flowers sessile or very short-pedicellate

Calyx and corolla glabrous, the former often diminute

Inflorescence capitate, the receptacle globose or clavate

Sect. 2. DIADEMA.

Inflorescence racemose or shortly spicate; calyx very short Sect. 3. BOURGONIA.

Calyx well developed, rarely glabrous; corolla very rarely glabrous, usually silky pubescent or villous

Sect. 4. PSEUDINGA.

Flowers short and slender, the corolla not over 2.5 cm. long (*Tenuifloræ*), Fl. pubescent or villous.

Rachis of the leaves wingless or almost so, or marginate below the upper pair of leaflets only; glands sessile or rarely obsolete Ser. (*a*) *Gymnopodæ*

Rachis of the leaves winged, but the wings rather narrow and sometimes obsolete Ser. (*b*) *Pilosiusculæ*

Flowers long and slender, the corolla not less than 2.5 cm. long, or shorter, but then very broad or the leaves villous-hairy (*Grandifloræ*)

Bractlets persistent; calyx glabrous, puberulous or rarely pilose; flowers 2.5 cm. long or over Ser. (*c*) *Calocephalæ*

Bractlets caducous

Glands long stipitate; leaves and branchlets coarsely hairy or setose; corolla 2.5 cm. long or over Ser. (*d*) *Vulpinæ*

Glands sessile or short stipitate; leaves pubescent, villous or hispid

Corolla 2.5 to 5 cm. long, slender Ser. (*e*) *Longifloræ*

Corolla 2.5 cm. long or less,, thick Ser. (*f*) *Dysanthæ*

Legume tetragonous or cylindrical, the margins broad or many-sulcate Sect. 5. EUINGA

Legume tetragonous; leaves generally large and rufescent Ser. (*a*) *Tetragonæ*

Legume cylindrical, many-sulcate; leaves smaller or the leaflets narrower. Ser. (*b*) *Sulcatæ*

DESCRIPTION OF SPECIES

Section 1. LEPTINGA

Flowers glabrous or tomentellous, distinctly pedicellate on a short receptacle and forming an umbel-like head. Rachis of the leaves wingless or more or less winged; glands substipitate or long-stipitate.

Flowers nearly glabrous; rachis of the leaves more or less winged; leaflets 2–jugate

Calyx about 25 mm. long, the pedicels about four times shorter; rachis winged from the base 1. *I. portobellensis*

Calyx 3 mm. long, the pedicels about 3 times longer; rachis winged towards the apex only 2. *I. gracilipes*

Flowers tomentellous, the pedicels as long as or longer than the calyx; rachis of the leaves terete

Branchlets, leaves and pods villous; leaflets 4 or 5–jugate. Glands long-stipitate 3. *I. saffordiana*

Branchlets and leaves not villous; leaflets 3 or 4–jugate

Leaflets elliptic, 1 to 2.5 cm. broad; flowers about 9 mm. long from base of pedicels to tips of corolla lobes 4. *I. Williamsii*

Leaflets ovate or obovate, 1.5 to 8.5 cm. broad; flowers 14 to 18 mm. long from base of pedicel to tips of corolla lobes 5. *I. roussoviana*

1. **Inga portobellensis** Beurling. Svensk. Kongl. Vetensk. Akad. Handl. 1854: 122.

A tree, completely glabrous: branchlets terete, with grayish bark. Rachis of the leaves winged from the base, 8 to 10 cm. long, the petiolar part 2 to 3.5 cm., the wings between the leaflets accrescent from the base, with a rounded apex, 1.5 to 2 cm. broad; leaflets 2-jugate, coriaceous, sessile, the basal pair subdeciduous; glands large, subsessile, concave; blades obovate-oblong, rounded and subemarginate at the base, abruptly acuminate at the apex, dark green above with the costa and nerves impressed, beneath paler or brownish with prominent nervation, those of the basal pair 10 to 14 cm. long, about 10 cm. broad. Inflorescences axillary or terminal, single; peduncles about 4 cm. long; bractlets lanceolate or ovate, calyx tubular, finely striate, about 25 mm. long; 6 to 8 mm. long, caducous; pedicels thick, 5 to 6 mm. long; corolla tubular, broadened at the

apex, 35 to 38 mm. long, the teeth short, acute, cano-pubescent; stamen tube exserted; style capitellate. Legume flattened, thick, straight, with a very thick margin; seeds 16 to 20.

Type collected at Porto Bello, Panamá, by Billberg. Specimens examined:

COSTA RICA: Around Santo Domingo de Osa, flowers March, 1896, Tonduz (Ins. Fis. Geogr. Costa Rica, No. 9879).

2. **Inga gracilipes** Standley, Journ. Wash. Acad. **15**: 101. 1925.

A tree about 6 m. high, the young branchlets sparsely puberulent at first, almost glabrous later. Rachis of the leaves narrowly winged between the two pairs of leaflets only, 3 to 5 cm. long, the petiolar part 1.5 to 3 cm., the wings attenuated towards the base; leaflets 2-jugate, coriaceous, sessile, elliptic-oblong, abruptly and shortly obtuse-acuminate, glabrous and lustrous above with prominent venation, 6–11 cm. long, 2.5–4.5 cm. broad; glands sessile, cupshaped. Inflorescences axillary or terminal, the umbels paniculate; peduncles very slender, 2.5–4.5 cm. long, solitary or fasciculate; pedicels filiform, 8–10 mm. long; calyx tubular, 3 mm. long, minutely puberulent; corolla narrow-funnelform, 8 to 9 mm. long, glabrous; stamen tube short-exserted. Young legume flattened, oblong, the margins hardly thickened.

Type from a brushy slope between France Field, CANAL ZONE, and El Catival, province of Colón, PANAMÁ, near sea level, January 9, 1924 (P. C. Standley No. 30353, in U. S. Nat. Herb.)

3. **Inga saffordiana** Pittier, Contr. U. S. Nat. Herb. **18**: 176. 1916.

A small, slender tree, the young branchlets densely set with long, brown hairs. Rachis of the leaves terete, villous, 5 to 12 cm. long; stipules subulate, villous, 5 to 12 mm. long; leaflets 4 to 5-jugate, leathery; glands very small and long stipitate; petiolules villous, 2 to 3 mm. long; blades more or less oblique, ovate to lanceolate, acuminate, glabrous on the faces except on the costa and veins, sparsely long ciliate on the margin, 3.5 to 14 cm. long, 2 to 4 cm. broad, the terminal pair largest. Inflorescences axillary or issuing from the trunk, single, the peduncles villous, 4 to 13 cm. long; pedicels 1.5 to 2 cm., villous as are the subulate, 5 to 10 mm. long, persistent bractlets; calyx, corolla, etc., not known. Legume 15 to 32 cm. long, 2.5 to 3 cm. broad, densely brown-villous, cuneate at the base, rounded emarginate and mucronate; seeds up to 17 to each pod.

PANAMÁ: Forests of Cerro de Garagará, in the Sambú Valley, southern Darién, at an altitude of about 500 meters, young pods, February 8, 1912, *Pittier* 5676; type.

4. **Inga Williamsii** Pittier, Contr. U. S. Nat. Herb. **18**: 176. 1916.

A small tree. Rachis of the leaves grayish or brownish tomentose, 5 to 7.5 cm. long; leaflets 3 to 4-jugate, the petiolules pubescent, 2 to 3 mm. long, the blades elliptic, 2 to 8.5 cm. long, 1 to 2.5 cm. broad, with the costa and veins prominent beneath and pubescent on both sides. Umbels single or geminate in the upper axils; peduncles ferruginous-tomentose, 1 to 1.5 cm. long; pedicels densely pubescent, 3.5 to 4 mm. long; calyx villous-pubescent, 3.5 to 4.2 mm. long; corolla densely villous, 5.2 to 5.9 mm. long; staminal tube hardly exserted. Legume not known.

PANAMÁ: Bismarck, above Penonomé, province of Coclé, flowers, March 5, 1908, *Williams* 285; type.

5. **Inga roussoviana** Pittier, Contr. U. S. Nat. Herb. **18**: 32, pl. 82. 1916.

A small tree. Rachis of the leaves ferruginous-pubescent or glabrous, 12 to 15 cm. long; leaflets 3 to 4-jugate, glabrous or pubescent, the petiolules about 4 mm. long, the blades ovate or obovate, 4.5 to 18 cm. long, 2.5 to 8.5 cm. broad, the terminal pair largest. Umbels forming panicles on short axillary or terminal shoots, and single or 2 to 4-fasciculate on the defoliated nodes; peduncles grayish or brownish tomentose, 1 to 1.5 cm. long; pedicels pubescent, 4 to 7 mm. long; calyx pubescent, 5 mm. long; corolla long funnel-shaped, 9 to 11 mm. long, densely villous; stamen tube inclosed or slightly exserted. Legume pedunculate, ferruginous-pubescent, rounded at the base, apiculate, 11 to 17 cm. long, the sides 2 to 2.3 cm. broad, the margin prominent.

PANAMÁ: around San Félix, eastern Chiriquí, in woods, flowers, December 23, 1911, *Pittier* 5270; type.

COSTA RICA: Vicinity of Santo Domingo de Osa, in forest, fruits March 1896, *Tonduz* (Inst. Fís. Geogr. 10032).

BRITISH HONDURAS: Punta Sierra, on the banks of a highland creek, flowers January 16, 1903, Percy *Wilson* 41.

Section 2. DIADEMA

Flowers glabrous or pubescent, often small, capitate at the end of a clavate peduncle, sessile or short pedicellate, in the latter case the stipules large and persistent and the pedicels not longer

than the calyx. Rachis of the leaves wingless, terete or narrowly canaliculate. Glands small or obsolete. Peduncles long, axillary.

Stipules small, caducous; flowers sessile. Leaves and flowers glabrous or almost so

Leaflets very short-petiolulate, or subsessile, membranous 6. *I. membranacea*

Leaflets distinctly petiolulate, coriaceous

Floral peduncles very short; receptacle ovoid; stamen tube exserted 7. *I. Peckii*

Floral peduncles rather long (3 to 8 cm.); receptacle globose; stamen tube included 8. *I. Jinicuil*

Stipules large, persistent; flowers pedicellate

Leaflets 4 or 5-jugate; glands sessile; corolla 3.5 to 7.5 mm. long; legume fewseeded, stipitate 9. *I. paterno*

Leaflets 3 or 4-jugate; glands at least substipitate; corolla 8 to 8.5 mm. long; legume many seeded, rounded at base 10. *I. radians*

6. **Inga membranacea** Benth. Trans. Linn. Soc. London, **30**: 606.

Plants subglabrous. Leaflets 2 or 3-jugate, very short petiolulate, ovate-elliptic, obtuse-acuminate, 5 to 8 cm. long, membranous, nitidulous, venulous. Peduncles slender. Flowers sessile, glabrous. Calyx 3.2 mm. long; corolla 6.3 mm. long. Legume not known.

Type collected in Veragua, Panamá, by Seemann.

This species I have not seen.

7. **Inga Peckii** Robinson, Proc. Amer. Acad. **49**: 502. 1913.

Branchlets terete, more or less geniculate, the grayish bark covered with numerous lenticels. Rachis of the leaves wingless, angular, striate, about 15 cm. long; leaflets 2 or 3 jugate, petiolulate, subcoriaceous; petiolules 4 to 6 mm. long; leaflet blades -oblong acuminate at the base and apex, almost lustrous above, opaque or subglabrescent beneath, 9 to 17 cm. long, 3.5 to 7.5 cm. broad. Inflorescences many-clustered in the axils of the leaves; peduncles short and slender, pubescent (?); receptacle ovoid; flower head ovoid, often 18 to 20-flowered, sessile; calyx about 2 mm. long, subcylindraceous, short toothed, the teeth obscurely ciliate-hispidulous; corolla glabrous, tubular, slender and slightly broadening toward the apex, the lobes very short and deltoid; stamen tube exserted. Legume glabrous, falcate-oblong, about 13 cm. long, 2.2 broad, 11-seeded.

Type (in Gray Herbarium) collected in BRITISH HONDURAS, by Morton Peck No. 673.

This species, which I have not seen, is said to be nearly related to *I. Jinicuil* Schlecht. It differs in its much shorter peduncles, thicker, duller, and less reticulate leaflets, shorter corolla teeth and exserted stamen tube.

8. **Inga Jinicuil** Schlecht. Linnaea **12**: 559. 1838.

A medium-sized tree. Branchlets slender, flexuous, glabrous, the grayish bark densely covered with white prominent lenticels. Leaves entirely glabrous; rachis subterete, slightly thickened at the insertion of the leaflets, 6 to 10 cm. long; stipules caducous, oblong, obtuse, 5 to 7 mm. long; leaflets 3-jugate, coriaceous, long-petiolulate; glands (when present) more or less prominent and flat at the apex, but mostly obsolete; petiolules about 5 mm. long, thickened; leaflet blades ovate to elliptic, cuneate at the base, acute or acute-acuminate at the apex, lustrous, dark green above, with the costa impressed and the veins slightly elevated, beneath paler and delicately prominent-reticulate, the blades of the basal pair 4 to 8 cm. long, 1.5 to 3 cm. broad, those of the terminal pair 8 to 12 cm. long, 3.5 to 5 cm. broad. Flower heads 1 to 6 in the axils of the leaves or on the nodes of defoliate branchlets; peduncles glabrous or minutely pubescent, 3 to 8 cm. long; receptacle globose, 3 or 4 mm. in diameter; flowers sessile; calyx tubular, often stipitate, strigose-pubescent, 2.3 to 3 mm. long, the teeth small, obtuse, incurved; corolla broadly tubular-infundibuliform, 6.5 to 7.1 mm. long, the lobes narrow, acute, about 2 mm. long, minutely glandular-pubescent at the tip; stamen tube inclosed; pistil about 8 mm. long; ovary glabrous, substipitate, 2 mm. long; style truncate. Legume (according to Bentham and Schlechtendal) glabrous, the seeds 6 to 10, immersed in a white pulp. Specimens examined:

MEXICO: Jalapa, Veracruz, alt. 1400 meters. *Schiede*, type collection, represented by 3 sheets in the Gray Herbarium. Córdoba Valley, Veracruz, flowers April 27, 1866, *Bourgeau* 2043 bis; Jalapa, Veracruz, alt. 1300 meters, flowers April 13, 1899, *Pringle* 3134, Teocelo, near Jalapa, Veracruz, in coffee plantations, alt. 1218 m. flowers May 8, 1901, *Goldman* 690; Orizaba, alt. 1264 meters, flowers March 27, 1867, *Bilimek* 135.

9. **Inga paterno** Harms, Repert. Spec. nov. **13**: 419. 1914 (Pls. XIII, XIV.)

A medium sized tree; branchlets glabrous, lenticellose. Leaves glabrous or glabrescent; rachis more or less marginate between the

leaflets, 8.5 to 15 cm. long; stipules obovate to oblong, 1.5 to 2 cm. long, persistent; leaflets 4- to 5-jugate; glands sessile, sometimes reduced or obsolete; petiolules 4 to 6 mm. long; blades elliptic to ovate-lanceolate, obtuse-acuminate, coriaceous, reticulate, 5 to 17 cm. long, 2 to 6 cm. broad. Inflorescences mostly terminal and paniculate; peduncles glabrous, 3 to 7.5 cm. long. Flowers pedicellate; bractlets subulate, pubescent, shorter than the pedicels, these glabrous, 1 to 2 mm. long; calyx tubulous, 1 to 2.5 mm. long, more or less pubescent; corolla glabrous, tubulous-campanulate, 3.5 to 7.5 mm. long; stamen tube inclosed; ovary glabrous. Legume pedunculate, long stipitate (the stiplets inserted laterally), rounded at the apex, glabrescent, 9 to 12 cm. long, 4 to 5 cm. broad.

Specimens examined:

MEXICO: Oaxaca, alt. 1650 meters, flowers April 9, 1894, *Purpus*.

GUATEMALA: Barberena, Department of Santa Rosa, alt. 1,000 meters, flowers July 1893, *Heyde & Lux* (J. D. Smith, No. 3280). San Miguel Uspantán, Department of Quiché, alt. 2,000 meters; flowers April 1892, *Heyde & Lux* (J. D. Smith, No. 3309). Cuajiniquilapa, Department of Santa Rosa, alt. 350 meters, flowers November 1893, *Heyde & Lux* (J. D. Smith, No. 6122). Chinantla, Department of Guatemala, alt. 1,300 meters, flowers May 1892, *J. D. Smith* 2819.

COSTA RICA: Alajuela, alt. 900 meters, flowers March 1896, *J. D. Smith* 6490. Near San José in coffee plantations, flowers April 6, 1903, *Cook & Doyle* 15.

10. **Inga radians** Pittier, Contr. U. S. Nat. Herb. **18**: 178. 1916.
(Pls. XV, XVI, XVII, XVIII, XIX.)

A tree; branchlets subangulous, the young shoots more or less ferruginous-pubescent. Rachis of the leaves remotely puberulous or glabrous, 10 to 14 cm. long, the petiolar part 1.5 to 4 cm. long; stipules obovate, glabrous, persistent, about 1.5 cm. long; leaflets 3 or rarely 4-jugate, petiolulate; glands stipitate, often reduced to the basal one or all obsolete; petiolules 5 mm. long; blades elliptic to ovate, rounded or subcuneate at the base, long acuminate, glabrous, 7 to 8 cm long and 4 to 7.5 cm. broad. Inflorescences 1 to 3 in the axils of the upper leaves; peduncles 8 to 12 cm. long, loose, striate, sparsely puberulous; bractlets naviculiform, caducous, about 2 mm. long; pedicels about 2 mm. long, glabrous or sparsely puberulous; calyx 2.3 mm. long, sparsely pubescent; corolla tubulous-funnelform, 8 to 8.5 mm. long, the lobes 1.5 to 2 mm. deep, with the tips rounded,

inflected inside, minutely puberulous; stamen tube hardly exserted; ovary glabrous, elongated; style as long as the stamens. Legume pedunculate, rounded at the base, obtuse at the apex, glabrous, about 40 cm. long and 3 cm. thick, 6.5 to 8.5 cm. broad, the margins thick, 1.2 to 1.5 cm. broad; seeds about 15, ovoid oblong, slightly depressed, surrounded with a white sweet pulp.

Specimens examined:

MEXICO: Tapachula, Chiapas, in coffee plantations, flowers April 26, 1902, *Cook*, 805; type, Oaxaca, alt. 1650 meters, flowers December 1900, *Conzatti & González* 1146.

Section 3. BOURGONIA

Flowers small, glabrous or sparsely puberulous or pubescent, sessile or very short pedicellate on a loose, slender, more or less pubescent rachis. Corolla funnelform or campanulate, about four times longer than the very small calyx. Legume flat or rounded glabrous, more or less broad, narrowly marginate. Rachis of the leaves canaliculate, marginate or narrowly winged; glands sessile, small, pertuse.

Rachis of the leaves winged or, rarely, marginate; leaflets elliptic to ovate-lanceolate, long-acuminate; legume narrow (1 to 1.7 cm. broad) 11. *I. marginata.*

Rachis of the leaves marginate; leaflets ovate or obovate, more or less obtuse; legume about 2.5 cm. broad 12. *I. laurina.*

11. **Inga marginata** Willd, Sp. Pl. **4**: 1015. 1806.

A middle-sized tree. Leaves glabrous; rachis 2.5 to 5 cm. long, rarely marginate, usually winged, the wings very narrow below the first pair of leaflets, broader below the terminal pair; leaflets usually 2-jugate, coriaceous or membranous, short-petiolulate, lanceolate or oblong-lanceolate, long-acuminate, 6 to 12 cm. long, 2 to 4 cm. broad. Flower spikes axillary or terminal, solitary or fasciculate, 5 to 10 cm. long, not very dense; flowers sessile of subsessile; calyx 1.5 mm. long, pubescent at the base; corolla white, campanulate, about 4 mm. long; stamen tube long-exserted. Legume sessile, thickened around the seeds, 5 to 12 cm. long, 1.7 cm. broad.

Type from Caracas, VENEZUELA.

Specimens examined:

COSTA RICA: Atirro, Reventazón Valley, alt. 600 meters, flowers April 1896, *J. D. Smith* 6493. Vicinity of Sipurio, Talamanca,

alt, about 60 meters, flowers March 1894, *Tonduz* (Inst. Fís. Geogr. 8710). Banks of the Río Tuís, Reventazón Basin, alt. 650 meters, flowers October 1897, *Tonduz* (Inst. Fís. Geogr. 11349). Buenos Aires, Diquís Valley, flowers January 1892, *Tonduz* (Inst. Fís. Geogr. 6690). Las Vueltas de Tucurrique, Reventazón Valley, flowers November 1898, *Tonduz* (Inst, Fís. Geogr. 12744). Jiménez, Llanos de Santa Clara, flowers September 1896, *Cooper* (Inst. Fís. Geogr. 10198).

PANAMÁ: Near Lion Hill railway station, in damp woods, *Hayes* 468. Lake shore along the Gatún Valley, flowers and fruits March 25, 1914, *Pittier* 6512. Boca de Pauarandó, southern Darién, fruits February 4, 1912, *Pittier* 5579. Bismarck, above Penonomé, Province of Coclé, fruit March 15, 1908, *Williams* 600.

12. **Inga laurina** Willd. Sp. Pl. **4**: 1018. 1806. (Pls. XX, XXI, XXII.)

A small tree, usually with a broad crown. Leaves glabrous or almost so; rachis marginate, 1.5 to 10 cm. long; leaflets 2 or 3-jugate, coriaceous, short petiolulate, oblique, ovate or obovate, attenuate at the base, obtuse or broadly acuminate and emarginate at the apex, 3 to 14 cm. long, 1.5 to 4.5 cm. broad. Flower spikes axillary or terminal, solitary or geminate, 4 to 15 cm. long; flowers sessile or subsessile, sweet-scented; calyx tubular, glabrous or glabrescent, 1.2 to 1.9 mm. long; corolla white, tubular-campanulate, 4 to 5 mm. long; stamen tube long-exserted. Legume 7.5 to 10 cm. long, about 2.5 cm. broad.

Type from SAINT CHRISTOPHER ISLAND, Lesser Antilles.
Specimens examined:

MEXICO: Vicinity of Acapulco, Guerrero, flowers March 1 to 10, 1895, *Palmer* 584. Hacienda de San Marcos, Jalisco, fruits June 4, 1893. *Pringle* 5494.

EL SALVADOR: Near Juayúa, Department of Sonsonate, alt. 1470 meters, flowers February 27, 1907, *Pittier* 1990.

PANAMÁ: Boca Chica de Horconcitos, western Chiriquí, *Seemann* 1689; at water edge; probably at the same locality, flowers December 15, 1911, *Pittier* 5119; Bismarck, above Panamá, Province of Coclé, flowers March 1908, *Williams* 532.

Section 4. PSEUDINGA

Flower spikes erect, at first short, becoming longer as the flowering proceeds; flowers sessile, subsessile, or rarely pedicellate. Calyx tubular, narrow, hairy or rarely glabrous. Corolla silky-villous (except in series *Glabriflorae*, not as yet reported from Central America). Legume flat, more or less thin or inflated at the seed: margins naked, rounded or more or less elevated around the sides, glabrous or hairy. Petioles naked or winged. Glands often obsolete; flower spikes often axillary, or corymbose or paniculate at the ends of the branches.

Series a–*Gymnopodæ* Benth.

Corolla densely silky-pubescent or villous, rarely sparsely strigose; calyx tubular, pilosulous or pubescent; bracts small, caducous; glands sessile or nearly so, or obsolete; petiole usually naked or narrowly marginate.

Flowers short-pedicellate; branchlets and leaves glabrous; peduncles and pedicels pilosulous; leaflets 3- 4-jugate
13. *I. brevipedicellata*

Flowers sessile

Branchlets, leaves, and peduncles more or less appressed-pubescent, or glabrescent

Leaflets 3-jugate; legume more or less stipitate
14. *I. leptoloba*

Leaflets 2-jugate, legume rounded at the base
15. *I. punctata*

Branchlets, leaves, and peduncles more or less ferruginous-hairy

Leaflets obovate, 2-jugate 16. *I. pinetorum*

Leaflets ovate-elliptic or lanceolate, 4 to 10-jugate

Inflorescences more or less densely paniculate at the end of the branchlets

Corolla 7 to 9 mm. long; rachis of the leaves thick, angular; leaflets elliptic-oblong or obovate, 4-8-jugate 17 *I.. ruiziana*

Corolla 18 mm. long; rachis of the leaves terete; leaflets lanceolate, long acuminate, 5-6-jugate 18. *I. Recordii*

Inflorescences not paniculate, the peduncles solitary or few clustered in the axils of the leaves, these with slender rachis

Leaflets 5- or 6-jugate, pubescent beneath; flower spikes solitary or geminate; calyx 7 mm. long; corolla 18.5 mm. long

19. *I. æstuariorum*

Leaflets 5 to 10-jugate, puberulous on both sides; flower spikes 3 to 5-clustered; calyx 6 mm. long; corolla 23 to 25 mm.

20. *I. multijuga*

13. **Inga brevipedicellata** Harms, Repert. Sp. nov. **19**: 62. 1923.

A tree, the branchlets grayish. Leaves small, glabrous, the rachis wingless, angulous, 8–15 cm. long including the petiolar part 2.5–3.5 cm. long; leaflets 3-4-jugate, very shortly petiolulate, oblong to oblong-lanceolate, short acuminate and glabrous. Inflorescences pedunculate, 1 to 3 in the axils of the leaves; peduncles pilosulous, 6–8 cm. long including the rachis; flowers numerous, small, short pedicellate, the pedicels 2 mm. long, pilosulous; calyx 3 mm. long, funnelform, puberulous; corolla appressed pilose, 5 to 6 mm. long.

MEXICO: Type from Mirador, Veracruz, alt. 1,000 m.; fl. Febr. 1921 and 1922 (*J. A. Purpus* 282); Zacuapan, Veracruz (*Purpus* 3675).

14. **Inga leptoloba** Schlecht. Linnaea **12**: 559. **1888.** (Pls. XXIII, XXIV, XXV.)

A tree of middle or small size. Branchlets slender, terete, glabrous or minutely appressed-pubescent, covered with minute lenticels. Leaves rather small, more or less pubescent or puberulous, sometimes glabrous; stipules sparsely hairy, 3 to 4 mm. long, subulate, caducous; rachis distinctly marginate between the leaflets, or sometimes subterete, more of less appressed-pubescent, 4 to 10 cm. long, the petiolar part 1.5 to 3 cm. long; leaflets 3-jugate, petiolulate, coriaceous; glands obsolete, or apparent and then small or large, prominent or immersed, almost always pertuse; petiolules 1 to 5 mm. long, pubescent or almost glabrous; leaflet blades more or less oblique, ovate-elliptic or lanceolate, usually cuneate or sometimes rounded at the base, obtuse, obtusely or acutely acuminate but nearly always mucronate at the apex, sparsely covered with appressed hairs on both sides, above lustrous, with the costa and veins slightly prominent, beneath paler or brownish, with the costa and veins prominent and more or less pubescent, the blades of the basal pair of leaflets 3.5 to 10.5 cm. long and 1 to 4.5 cm. broad, those of the terminal pair 9 to 17 cm. long and 2.7 to 7 cm. broad. Inflorescences axillary, the spikes then 2 to 7 or more together, or terminal

and paniculate, the spikes then either in fascicles of 2 to 4 or more in the upper axils, or borne on axillary defoliate shoots; spikes 2 to 6 cm. long, the peduncles angular, 1.5 to 5 cm. long, more or less appressed-pubescent, the rachis very short and pubescent; bractlets subulate, densely pubescent, less than half as long as the calyx; flowers sessile; calyx tubular, the upper part slightly broadened, 4.4 to 6 mm. long, more or less pubescent, the teeth irregularly cleft and acute; corolla tubular-funnelform, 6.5 to 10 mm. long, silky-villous, the lobes lanceolate, about 2 mm. long; stamen tube equalling the corolla or slightly exserted; ovary glabrous; style capitellate. Legume flat, more or less cuneate and stipitate at the base, abruptly and obliquely acuminate at the apex, the margins appressed-pubescent, thick and prominent around the faces, 2 to 2.3 cm. broad, 5 to 18 cm. long: seeds 3 to 20, immersed in a thin pulp.

Specimens examined:

MEXICO: Hacienda de la Laguna, near Jalapa, Veracruz, alt. about 1,400 meters, *Schiede:* probably the type collection, in Gray Herbarium. Wartenberg, near Tantoyuca, Veracruz, April 1858, *Ervendberg* 4. Córdoba Valley, Veracruz, March 4 and May 6, 1866. *Bourgeau* 2043, 2320. Outskirts of Tuxtepec, Oaxaca, flowers April 9, 1894, *Nelson* 377. Coatzacoalcos, Veracruz, flowers April 16, 1895, *C. L. Smith* 987, 1146. Between San Juan Bautista and Atasta, Tabasco, flowers March 14, 1888, *Rovirosa* 128. Without locality, *Kerber* 403.

GUATEMALA: Setzimaj, Alta Verapaz, flowers March 19, 1902. *Cook & Griggs* 51, 52, 53. Sepacuité, Alta Verapaz, flowers April 7 and 17, 1902, *Cook & Griggs* 491, 636. Las Viñas, Santa Rosa, flowers September 1893, *Heyde & Luz* (J. D. Smith, No. 6094.)

HONDURAS: San Pedro Sula, Santa Barbara, flowers March 1890, *Thieme* (J. D. Smith, No. 5209).

EL SALVADOR: Vicinity of San Salvador, Renson 238.

COSTA RICA: San José, common in hedges and pastures, fruits May 1888, *Pittier* (Inst. Fís. Geogr. 233); flowers September 14, 1889, *Tonduz* (Inst. Fís. Geogr. 1417). Along Río Ciruelas, near Barba, flowers March 15, 1890, *Biolley* (Ins. Fís. Geogr. 3230). Along Río Torres, near San José, flowers and fruits November and December, 1895, *Tonduz* (Inst. Fís. Geogr. 8010, 9793). Banks of Río Tibás, near San Juan, flowers January 1913, *Jiménez* 821. Forests of El Palmar de Boruca, Diquís Valley, fruits April 18, 1892, *Tonduz* (Inst. Fís. Geogr. Costa Rica, No. 6756).

PANAMÁ: El Boquete de Chiriquí, Seemann 1690.

As has been stated elsewhere[1] by the writer, *Inga leptoloba* differs from *Inga punctata*, in its 3-jugate leaflets, these usually narrow and cuneate at the base, and in its narrower and fuller legumes, which besides, are almost always stipitate or at least cuneate at the base. These two species are often hopelessly confused in herbaria, and it must be admitted that at times, it is difficult to distinguish the two species.

15. Inga punctata Willd. Sp. Pl. 4: 1016. 1806.

A tree. Branchlets subangular or almost terete covered with whitish punctiform lenticels. Leaf rachis terete, glabrescent or sparsely covered with short appressed hairs, 3 to 5.5 cm. long, the petiolar part 1.5 to 2 cm. long; leaflets **2-jugate, rarely 3-jugate, short**-petiolulate; glands small, sessile, depressed or rounded, sometimes obsolete; petiolules pubescent, 1 to 2 mm. long; leaflet blades oblique, oblong or elliptic-lanceolate, short-cuneate at the base, acuminate at the apex, mucronate, sparsely pubescent on both faces, lustrous above, with the costa and veins slightly prominent, beneath paler, with the costa and veins strongly prominent, the blades of the lower pair of leaflets 7 to 7.5 cm. long and about 3 cm, wide, those of the upper pair 12 to 13 cm. long (4 inches, or about 10 cm., according to Bentham) and 4 to 5 cm. broad; stipules subulate, 6 to 7 mm. long. Inflorescences axillary, the spikes 1 to 4-clustered, about 3 cm. long; peduncles angular, sparsely pubescent, 1 to 2 cm. long; flowers sessile; calyx tubular but broadening toward the apex, grayish-pubescent, 2.7 to 3.4 mm. long, the teeth irregular; corolla tubular-funnelform, silky-villous, 6.6 to 7.5 mm. long (3 lines, or 6.3 mm. long according to Bentham), the lobes 1.5 to 2 mm. long, rather broad; stamen tube slightly exserted. Legume rounded at the base, often abruptly substipitate, 15 cm. long or over, about 2.5 cm. broad, at first pubescent, glabrous in age, depressed, the margins slightly elevated.

Specimens examined:

MEXICO: Tapachula, Chiapas, a shade tree, flowers November 12, 1918, *Popenoe* 814.

GUATEMALA: Cubiquiltz, Alta Verapaz, alt. 350 meters, flowers March 1902; *Turckheim* (J. D. Smith, 8195.) Morales, Department of Izabal, flowers March 1907, *Kellerman* 6109. San Francisco de Miramar, Costa Cuca, fruits April 1905, *Pittier* 68.

COSTA RICA: Along Amóura River, near Xirores, Talamanca, in forests, flowers February 1895, *Tonduz* (Inst. Fís. Geogr. 9354,

[1] Contr. U. S. Nat. Herb. 18: 188. 1916.

9355). Plains of San Carlos, in open field by creek, flowers April 15, 1903, *Cook & Doyle* 92. Turrialba, in pastures, flowers November 1893, *Tonduz* (Ins. Fís. Geogr. Costa Rica, No. 8303).

PANAMÁ: Along Río Culebra, above Santa Isabel, province of Colón, flowers and fruits August 10, 1911, *Pittier* 4161.

15*a*. **Inga punctata chagrensis,** Pittier, subsp. nov.

A tree, 6 to 8 meters high. Branchlets subangular or almost terete, with or without white lenticels, the younger growth appressed-pubescent. Leaves larger than in the species; rachis submarginate, appressed-pubescent, 2 to 7 cm. long, the petiolar part 1 to 3 cm long; stipules setaceous, pubescent, caducous, about 8 mm. long; leaflets 2-jugate, petiolulate; glands usually large, sessile, orbicular, mostly flat, sometimes concave; petiolules pubescent, 2 to 3 mm. long; leaflet blades suboblique, elliptic-ovate to elliptic-lanceolate, attenuate and rounded at the base, acutely acuminate and mucronate at tip, sparsely appressed-pubescent on both surfaces, lustrous and darkish above, paler beneath, the costa and veins densely pubescent on both faces and prominent, but more so beneath, the blades of the lower pair 5 to 10.5 cm. long, 1.5 to 4 cm. broad, those of the upper pair 7 to 16 cm. long, 2 to 6 cm. broad. Inflorescences paniculate, the branchlets forming the common peduncle axillary or terminal; flower spikes in clusters of 2 to 5 on defoliate axils; peduncles angular, appressed-pubescent, about 3 cm. long; rachis pubescent 1 to 1.7 cm long; bractlets oblanceolate and naviculiform, pubescent, 2.5 mm. long, very caducous; flowers sessile; calyx tubular, narrow and slightly broadened toward the tip, 5.1 to 5.6 mm. long; corolla silky-villous, tubular-funnelform, 9.5 to 10.6 mm. long, the lobes narrow, about 2.7 mm. long; stamen tube slightly exserted. Legume subsessile, more or less arcuate, the sides flattened and transversely grooved between the seeds, rounded at the base, rounded and mucronate or abruptly acuminate at the tip, glabrescent, 9 to 12 cm. long, 18 to 20 mm. broad, the margins distinctly elevated around the broad sides; seeds 8 to 14.

Type in the U. S. National Herbarium No. 675176, collected on the banks of the Chagres River, Canal Zone, Panamá, flowers and fruits February 14, 1911, by *William R. Maxon* (No. 4788).
Additional specimen examined:

PANAMÁ: Gatún, Canal Zone, fruit February 10, 1911, *Goldman* 1865.

15 *b*. **Inga punctata panamensis** Benth. Trans. Linn. Soc. **30**: 613. 1875.

Branchlets terete or subangular, the bark covered with minute white lenticels; young shoots sparsely appressed pubescent, 3.5 to 4.5 cm. long, the petiolar part 2 cm. long; leaflets petiolulate; glands suburceolate, small, salient, pertuse, sometimes obsolete; petiolules pubescent, 2 to 3 mm. long; leaflet blades ovate-elliptic, oblique, cuneate or rounded-attenuate at the base, acuminate at the apex, mucronate, sparsely hairy on both faces, with the costa and veins prominent and pubescent, the blades of the lower pair 5 to 7.5 cm. long, 2 to 3.5 cm. broad, those of the terminal pair 7.5 to 11 cm. long, 3 to 4 cm. broad. Legume (immature) subsessile, abruptly long-acuminate, 6 to 7 cm. long, 18 mm. wide, the prominent margin densely pubescent.

Specimens examined: Panamá; Chagres, Province of Colón, young fruit February 15, 1850, *Fendler* 89.

The specimen in the Gray Herbarium, on which the above description is based, is of the type collection of this variety. It differs from *I. punctata chagrensis* in the shape and size of the leaflets, and in the glands, these being suburceolate, rather than flat and orbicular, and pertuse.

In other specimens, enumerated below and which I consider as representing the same variety, the leaflets are often much larger (up to 21 cm. long and 8.5 cm. broad), the glands are either as described above or obsolete, and the inflorescences are paniculate as in *Inga punctata chagrensis*, with which it agrees also in the other characters of the floral spikes. The flowers however, are distinctly smaller, the calyx being 3.4 to 5.5 mm. long and the corolla 6.7 to 10.5 mm. long.

The mature pod of *Pittier* 4161 is 10.5 cm. long and 2 cm. wide, and hardly differs from those of Subsp. *chagrensis*.

Specimens examined:

British Honduras: Forests near Manatee Lagoon, flowers and young fruits February 8, 1906, *Peck* 334.

Panamá: Cerro Gordo, near Culebra, Canal Zone, immature fruits January 10, 1911, *Pittier* 2309.

16. **Inga pinetorum** Pittier, Contr. U. S. Nat. Herb. **18**: 185. pl. 90. 1916.

A tree. Rachis of the leaves terete, ferruginous-pubescent. 2.5 to 3.5 cm. long; glands very small, urceolate; leaflets 2-jugate, the the petiolules 3 mm. long, the blades obovate, cuneate at the base, subobtuse and mucronate or sometimes acuminate at the apex, 4 to

12 cm. long, 2 to 5 cm. broad, puberulous; costa and veins pubescent, the former prominent and the latter impressed above, both prominent beneath. Floral spikes axillary, geminate, the peduncles ferruginous hairy, 5 to 6.5 cm. long; flowers sessile; calyx tubulous, stipitate, sparsely hairy, about 7 mm. long; corolla tubulous, broadening toward the apex, about 11.5 mm. long, silky villous, the lobes nearly 3 mm. long, narrow and acute; stamen tube slightly exserted; ovary glabrous, stipitate. Legume not known.
BRITITH HONDURAS: Pine ridge near Manatee Lagoon, flowers February 19, 1906, *Peck* 343; Type in Gray Herbarium.

17. **Inga ruiziana** G. Don. Gen. Hist. Dichl. Pl. **2**: 391. 1832.

A medium-sized tree, with flat, densely foliate crown; branchlets often minutely pubescent, covered with white, elongate lenticels. Leaves more or less pubescent, the rachis thick, rusty-colored, angular or marginate, 10 to 28 cm. long; glands sessile, orbicular; leaflets 4, 5, 6, and often 7 or 8-jugate, short petiolulate, elliptic-oblong or obovate, more or less rounded at the base, short acuminate and acute at the apex, sparsely ferruginous pubescent on both sides on the costa and veins, these very prominent beneath; petiolules 2 to 4 mm. long; blades prominent beneath; petiolules 2 to 4 mm. long; blades often lustrous above, 5 to 23 cm. long; 2.5 to 7 cm. broad, those of the terminal pair larger. Flower spikes solitary or 2 to 4-clustered in the axils of the upper leaves, or paniculate at the defoliate ends of the branchlets; flower heads broadly ovate; peduncles brownish-tomentose, 2 to 4 cm. long; bracts linear, about 1.5 cm. long and 2 mm. broad, caducous; flowers subsessile; calyx pubescent, 2.5 to 4 mm. long, the teeth acute and very short; corolla silky pubescent, 7 to 9 mm. long, the lobes broad, about 2 mm. long. Legume 8 to 13 cm. long, 2.5 to 4 cm. broad, flat, the margin elevated around the sides and acutely ridged; seeds 12 to 15.

Type from Perú.

Specimens examined:

NICARAGUA: San Juan del Norte, February 18, 1896, *C. L. Smith* 7.
COSTA RICA: Xirores, Talamanca, in forests, flowers and fruits February 1895, *Tonduz* (Inst. Fís. Geogr. 9356). Vicinity of Port Limón, flowers October 4, 1895, *Tonduz* (Inst. Fís. Geogr. 9801). Las Vueltas de Tucurrique, Reventazón Valley, in pasture, flowers and fruits April 26, 1899, *Tonduz* (Inst. Fís. Geogr. 13054). Juan Viñas, Reventazón Valley, in coffee-plantations, flowers and fruits April 26, 1903, *Cook & Doyle* 391.

PANAMÁ: Near Marragantí, southern Darién, fruits, April 8, 1908, *Williams* 768. Along Sambú River, southern Darién, flowers and fruits February 7, 1912, *Pittier* 5533. Banks of Río Fató, near Nombre de Dios, Province of Colón, in forest, flowers, July 9, 1911, *Pittier* 3917. Valley of Masambí, on the road to Las Cascadas plantation, Canal Zone, fruits February 6, 1911, *Pittier* 2674. Gamboa, Canal Zone, flowers and fruits March 29, 1914, *Pittier* 6520.

Britton & Rose (North Amer. Flora, 23, 1:5) consider the collections placed here as belonging to a distinct species which they call *I. confusa*, giving my No. 5533 as type. I have not seen the type of *I. ruiziana*, but the specimens enumerated under this head agree so well with Bentham's description in the Flora brasiliensis (15, 2: 479) that I hesitate to accept the view of the botanists of the North American Flora.

18. **Inga Recordii** Britton & Rose, Trop. Woods **7**: 5. 1926.

A medium-sized tree with puberulent branchlets; rachis of the leaves wingless, pubescent, the petiolar part 1 to 2 cm. long; glands large, cup-shaped; leaflets 5- to 6-jugate, lanceolate, long-acuminate, 5–13 cm. long, lustrous and more or less pubescent above, pale and appressed-pubescent beneath; spikes axillary or paniculate at the end of the branchlets, the peduncles 1–2 cm. long; floral bractlets very small; calyx appressed-pubescent, 4–5 mm. long; corolla slender, silky-pubescent, 18 mm. long; stamen tube inclosed, 3 cm. long; ovary terete, densely lanate.

BRITISH HONDURAS: Stann Creek District; flowers January 19, 1926 (*J. Record*, type).

GUATEMALA: Near Entre Ríos, río Motagua Valley; flowers March 1, 1926 (*J. Record* No. 40; wood sample in Yale collection 8871).

In the opinion of the authors, this species, which I have not seen, would be related to *Inga laurina*, a very characteristic member of Sect. *Bourgonia*, and at the same time with *I. Standleyana*, very distinct of this in habit, indumentation, shape of the flowers and of the fruit, which I have placed among the Pseudingæ-Dysanthæ. At the same time, it is incorporated, in the key of the North-American Flora (23, 1: 2), in a group which includes, besides the three species mentioned, I. *æstuariorum*, which I have placed among the Pseudingæ-Gymnopodæ. I have to confess that I cannot see but very distant affinities between these four species. From the description, I think that *I. Recordii* can be safely placed in the Gymnopodæ, near the last-named species.

19. **Inga aestuariorum** Pittier, Contr. U. S. Nat. Herb. **18**: 183. pl. 89. 1916.

A low bushy tree. Rachis of the leaves slender, 9 to 15 cm. long, terete or subangulous; glands prominent, sessile, cup-like; leaflets 5 to 6-jugate, coriaceous, the petiolules very short, the blades ovate to ovate-elliptic, broadly rounded at the base, obtuse or subacute and mucronate at the apex, pilosulous and often lustrous above, reticulate and sparsely pubescent beneath, 3 to 12 cm. long, 2 to 4.5 cm. broad, the costa densely pubescent and prominent beneath. Floral spikes axillary, single or geminate, the peduncles densely ferruginous-pubescent, 3 to 5 cm. long, the flowerheads loose and elongate; flowers sessile; calyx striate, pubescent, 7 mm. long, the teeth very short; corolla white, 18.5 mm. long, silky villous, the lobes narrow, about 2.5 mm. long; stamen tube briefly exserted, the stamens pink. Legume sessile, rounded at the base, apiculate, 14 to 20 cm. long, the faces glabrescent, 1.7 cm. broad, surrounded by the surelevated, densely ferruginous-pubescent margins; seeds about 10.

Specimens examined:

COSTA *Rica*: Boca Zacate, Diquís Delta, in the tide belt of the Pacific coast, flowers and fruits April 1892, *Tonduz* (Inst. Fís. Geogr. Costa Rica 6793). Laguna de Sierpe, *Pittier*.

20. **Inga multijuga** Benth. Trans. Linn. Soc. **30**: 615. 1875.

A small or middle-sized tree; branchlets ferruginous-pubescent, more or less densely dotted with minute white lenticels. Leaves more or less ferruginous-pubescent, the rachis slender, slightly marginate, 18 to 26 cm. long; glands small, subsessile, often laterally compressed; leaflets coriaceous, 5 to 10-jugate, short petiolulate (petiolules about 3 mm. long), ovate or oblong to ovate-elliptic, rounded and almost cuneate at the base, acute or acuminate at the apex, puberulous and lustrous above, pubescent and pale brown beneath, 4 to 17 cm. long, 1.5 to 6 cm. broad, those of the basal pair smallest, the costa and veins very prominent beneath. Flower spikes axillary, 2 to 5-clustered, the flower heads ovoid, calyx pubescent, 5 to 7 mm. long; corolla silky-villous, 23.5 to 25 mm. long. Legume not known.

Specimens examined:

GUATEMALA: Chirujijá Oxec, Alta Verapaz, flowers April 1902, ***Cook & Griggs*** **641, 729, 734, 739.** Cubilquitz, Alta Verapaz, flowers March 1913, *Türckheim* (J. D. Smith 4090).

PANAMÁ: Lion Hill railway station, Canal Zone, *Hayes* **645**; type collection.

Fendler's No. 51, collected in flower at Chagres, Province of Colón, January 24, 1850, and cited by Bentham under *I. multijuga*, evidently does not belong here. The leaves and inflorescences are very distinct, and the calyx and corolla are much broader, being respectively about 4.5 and 15 mm. long. The specimen in the Gray Herbarium looks rather like a large-flowered form of *I. ruiziana*.

Series b – *Pilosiusculæ* Benth.

Rachis of the leaves winged between the pairs of leaflets. Glands large or small, flat or urceolate, sessile or subsessile. Bractlets caducous, very small and ovate, or large (sometimes longer than the calyx) and then linear or subulate. Flowers sessile; calyx tubular, hairy, villosulous, sparsely pubescent or almost glabrous; corolla densely silky villous, villosulous, or pubescent. Legume, where known, broad, the margin slightly elevated around the faces.

Leaflets 2 or 3-jugate; peduncles 2 cm. long or less.

Leaflets glabrous except on the costa and veins; flowers rather large, the corolla 16 mm. long or over
21. *I. Hayesii.*

Leaflets sparsely pubescent above, fulvous-tomentose beneath; flowers small, the corolla not over 14.5 mm. long
22. *I. Tuerckheimii.*

Leaflets 3 or 5-jugate; peduncles 3 cm. long or more.

Leaflets glabrous except on the costa and veins; flower spikes solitary in the axils; glands large, flat, subpeltate
23. *I. monticola.*

Leaflets more or less hairy; flower spikes mostly clustered in the axils, glands very small and often obsolete

Leaflets and younger parts more or less ferruginous-tomentose.

Calyx sessile, the teeth acute; corolla 11.5 to 13 mm. long, densely rufous-villosulous; leaflets 3-jugate 24. *I. cobanensis.*

Calyx stipitate, the teeth rounded; corolla 8.5 to 10 mm. long, villous; leaflets 4 or 5-jugate
25. *I. mollifoliola*

Leaflets puberulous or sparsely villosulous.

Leaflets mostly 5-jugate, elliptic, acuminate; bractlets linear, 4 to 7 mm. long, calyx sparsely hairy 26. *I. Pringlei.*

Leaflets 4-jugate, oblong, obtuse; bractlets ovate, less than 1 mm. long; calyx densely hairy
27. I. *micheliana.*

21. **Inga Hayesii** Benth. Trans. Linn. Soc. **30**: 617. 1875.

A small tree, the branchlets terete, reddish, lenticellose, the younger parts more or less brownish-villous. Rachis of the leaves sparsely hairy, 5 to 11.5 cm. long, broadly winged; stipules obovate, pubescent without, 3 to 4 mm. long, caducous; leaflets 2 or 3-jugate, short petiolulate; petiolules very short, pubescent; blades ovate to lanceolate, rounded and subemarginate at the base, obtuse to acute at the apex, glabrous except on the costa and veins, 3.5 to 14 cm. long, 1.5 to 6 cm. broad. Inflorescences axillary, subsessile; bractlets pubescent, much shorter than the calyx, deciduous; calyx about 7.5 mm. long, striate, glabrous or subglabrous; corolla white, villous, about 16.3 mm. long, the lobes 3.5 to 4 mm. long; stamen tube inclosed; ovary sessile, glabrous, 6-ovulate; style equal to the stamens (about 4 cm. long from base), capitellate. Legume not known.

Type collected in Panamá by Hayes.

Specimens examined:

PANAMÁ: Hills around the Agricultural Experiment Station at Matías Hernández, near Old Panamá, flowers July 10, 1914, *Pittier* 6714.

22. **Inga Tuerckheimii** Pittier. Contr. U. S. Nat. Herb. **18**: 192. 1916.

A tree, the branchlets subangulous, covered with numerous white lenticels, the younger parts, rachis of the leaves and peduncles ferruginous-pubescent. Rachis of the leaves winged between the leaflets, 3.5 to 6 cm. long; glands small, irregularly shaped, substipitate; leaflets 3-jugate, coriaceous, the petiolules about 3 mm. long, the blades ovate, oblong or ovate-lanceolate, acute, 2.5 to 11 cm. long, 1 to 5.5 cm. broad, sparsely pubescent or glabrescent above, fulvous-pubescent, strongly veined and reticulate beneath, the costa and veins ferruginous-pubescent, the former impressed on the upper face of leaflet. Floral spikes in clusters of 4 to 5 in the upper axils, the peduncles 1 to 2 cm. long; bractlets ovate-lanceolate, 3 to 5 mm. long, pubescent, caducous; flowers sessile; calyx densely ferruginous-pubescent, 5.5 to 6.5 mm. long; corolla 12 to 14.5 mm. long, broader at the apex, ferruginous-pubescent; stamen tube inclosed; ovary sessile, depressed laterally. Legume not known.

Specimen examined:

GUATEMALA: Cobán, Alta Verapaz, alt. 1,450 meters, flowers April 1887, *Türckheim* (*J. D. Smith*, 1214, type).

23. **Inga monticola** Pittier, Contr. U. S. Nat. Herb. **18**: 190. *pl. 96.* 1916.

A spreading tree, 16 m. high, the branchlets terete, lenticellous, the younger parts ferruginous-pubescent. Rachis of the leaves narrowly winged, ferruginous-pubescent, 5.5 to 10 cm. long; leaflets mostly 4-jugate or less, the petiolules pubescent, 1 mm. long or less, the blades oblique, membranous, oblong or ovate-elliptic, rounded at the base, acute or short acuminate, glabrous and lustrous above, glabrous or sparsely hairy and reticulate beneath, 4 to 14.5 cm. long, 1.5 to 5.5 cm. broad, the costa and veins pubescent on both faces. Floral spikes single in the axils of the upper leaves, the peduncles ferruginous-pubescent, 3 to 4 cm. long; bractlets lineal, 1 to 3 mm. long; calyx substriate, minutely puberulent, 4.1 to 4.3 mm. long; corolla 7 to 8 mm. long, funnelform, minutely pubescent, the lobes about 1.5 mm. long; stamen tube inclosed. Legume 8 to 16 cm. long, 5 cm. broad, rounded at the base, acuminate, the faces glabrous, blackish, transversally grooved, the margin ferruginous-pubescent; seeds 5 to 10.

Specimen examined:

PANAMÁ: Bismark above Penonomé, Province of Coclé, flowers and fruits March 6, 1908, *Williams* 316; type.

24. **Inga cobanensis** Pittier, Contr. U. S. Nat. Herb. **18**: 188. 1916.

A tree, the pubescence ferruginous or rufous all over. Rachis of the leaves wingless on the petiolar part, winged between the leaflets, the glands small, sessile; leaflets 3-jugate, the petiolules hairy, up to 2 mm. long, the blades ovate, rounded at the base, acute or subacuminate, 3 to 11 cm. long, 1.5 to 5.5 cm. broad, glabrous above except on the pubescent venation, reticulate and tomentose beneath. Floral spikes 3 to 6 in the axils of the upper leaves, the peduncles densely pubescent, 1 to 3 cm. long, the flower heads elongate and many flowered; bractlets lineal hairy, shorter than the calyx; flowers sessile; calyx densely pubescent, 4.3 to 6.3 mm. long, the teeth short and acute; corolla 11.6 to 13.2 mm. long, villous, the lobes ovate-lanceolate, acute, 1.5 to 2 mm. long; stamen tube usually inclosed, the filaments about 3 cm. long from base of tube; ovary sessile, glabrous, flattened; style about 4.5 cm. long. Legume not known.

Specimen examined:

GUATEMALA: Cobán, Alta Verapaz, alt. 1450 meters, flowers April 1887, *J. D. Smith*, 1214, type.

25. **Inga mollifoliola** Pittier, Contr. U. S. Nat. Herb. **18**: 189. 1916.

A tree, the branchlets terete, glabrous, lenticellous, the younger part ferruginous-tomentose. Rachis of the leaves narrowly winged, densely ferruginous-tomentose, 4.5 to 9.5 cm. long; stipules lanceolate, sparsely hairy, about 5 mm. long; glands small, sessile, often obsolete; leaflets 4 to 5-jugate, short-petiolulate, membranous, oblique, elliptic-ovate or oblong, narrow and rounded at the base, acuminate, glabrous and lustrous above, softly ferruginous-tomentose beneath, 3.5 to 12 cm. long, 1 to 4 cm. broad, the costa and veins densely hairy and prominent beneath. Floral spikes single or 2 or 3-clustered in the upper axils, the peduncles densely ferruginous-pubescent, 2.5 to 4.5 cm. long; bractlets lineal or subulate, hairy, 3 to 4 mm. long; calyx more or less stipitate, 5 to 6 mm. long, coarsely pubescent; corolla 8.5 to 10 mm. long, villous, the lobes about 2 mm. long; stamen tube inclosed. Legume not known.

Specimen examined:

COSTA RICA: Rodeo de Pacaca, near San José, in forest, flowers January 1891, *Pittier* (Inst. Fís. Geogr. 3251, type). San Marcos de Dota, in forest, flowers March 1893, *Tonduz* (Inst. Fís. Geogr. 7548).

26. **Inga Pringlei** Harms, Repert. Sp. nov. **13**: 526. 1915.

A small tree; branchlets angular, velvety-villous, lenticellous. Rachis of the leaves more or less narrowly winged, ferruginous-hairy, 7 to 10 cm. log; leaflets mostly 5 sometimes 4-jugate, briefly petiolulate; glands very small, subsessile, pertuse; petiolules 1 mm. long; blades ovate to oblong-lanceolate, usually rounded at the base, acute, glabrescent above, paler and puberulous beneath, 2.5 to 3 cm. broad. Inflorescences single, geminate or ternate, axillary or terminal, the peduncles ferruginous-hairy, 4 to 6 cm. long, the flower heads elongate and dense; bractlets lineal, 4 to 7 mm. long; calyx slightly striate, sparsely and briefly ferruginous-hairy, 5 to 6 mm. long; corolla appressed-villous, 6 to 9 mm. long; stamen tube inclosed. Legume not known.

Specimen examined:

MEXICO: Near Jalapa, State of Veracruz, at an altitude of 1330 meter, flowers April 11, 1899 (*Pringle* 8125, type).

27. **Inga micheliana** Harms. Repert. Sp. nov. **13**: 525. 1915.

A tree; branchlets terete or subangular, densely ferruginous-hairy. Rachis of the leaves rather broadly winged, ferruginous-hairy, 5 to 9 cm. long; leaflets mostly 4-jugate, subsessile; glands

very small, subsessile, pertuse; blades oblong to lanceolate, obtuse, glabrescent above, sparsely villous beneath, 4 to 10 cm. long, 1.5 to 3.5 cm. broad. Inflorescences axillary, geminate; peduncles 3 to 4.5 cm. long, densely ferruginous-villous; flowers sessile; bractlets diminute, ovate, villous; decidous; calyx densely villous, 4 to 5 mm. long; corolla densely silky-villous, 10 to 11 mm. long; stamen tube inclosed. Legume not known.

Specimen examined:

GUATEMALA: Río Negro, Department of Quiché, alt. 1200 meters; flowers March 1892, *Heyde & Luz* (J. D. Smith 3319, type).

Series c–*Calocephalæ*

Rachis of the leaves winged or almost naked. Glands sessile or substipitate. Stipules and bractlets persistent. Flowers sessile, thick or slender; calyx tubular or campanulate, more or less hairy, sometimes striate; corolla silky villous. Legume large, flat or screw-twisted, glabrous or densely rufous-hairy.

Leaves glabrous or glabrescent; leaflets lustrous, bullate, usually 2-jugate, often 1-jugate; legume 30 to 60 cm. long, 7 cm. broad, glabrous, with rounded, not prominent margins 29. I. *spectabilis.*

Leaves more or less hairy. Legume seldom over 30 cm. long, either glabrous with prominent margins, or rufous-hairy, and flat or screw-twisted.

Rachis of the leaves narrowly winged below the terminal pair of leaflets only; legume glabrous

Leaves glabrescent; calyx 7 to 8 mm., corolla 13 to 15 mm. long; legume about 4 cm. broad 30. *I. panamensis.*

Leaves hairy; calyx 17 to 20 mm., corolla 29 to 32 mm. long; legume 2.5 to 3 cm. broad 31. *I. Purpusii.*

Rachis of the leaves completely winged; legume densely rufous-hispid.

Leaflets mostly 3-jugate, softly hairy above, velvety beneath; calyx 10.5 to 11 mm., corolla 23 to 23.5 mm. long; legume 5 to 6.5 cm. broad 32. *I. lindeniana.*

Leaflets mostly 4-jugate, sparsely hairy all over; calyx 14 mm., corolla 25 mm. long; legume 3 to 4.5 broad 33. *I. Goldmanii.*

28. **Inga spectabilis** Willd. Sp. Pl. **4**: 1017. 1805.

A middle-sized tree, the branchlets angular. Leaves glabrous or glabrescent; rachis 3.5 to 10 cm. long, marginate or narrowly

winged; stipules narrow lanceolate or lineal, 6 to 12 mm. long; glands large, sessile; leaflets 1 to 3-jugate, sessile or almost so, coriaceous, bullate, broadly ovate to obovate, obtuse or subacute, 8 to 26 cm. long, 5 to 14 cm. broad, lustrous above, the costa, veins and venules strongly prominent beneath. Floral spikes paniculate at the end of the branchlets, the peduncles thick, 2.5 to 4 cm. long, minutely pubescent; bractlets ovate-lanceolate, pubescent; calyx broad, 7 to 8 mm. long, minutely pubescent; corolla white, 18 mm. long, silky villous. Legume glabrous, 30 to 60 cm. long, about 7 cm. broad and 2.5 to 3 cm. thick, the margins rounded, the apex obtuse; seeds 7 to 16 or more.

Type probably from Santa Marta, Colombia, from a cultivated tree.

COSTA RICA: Turrialba, flowers November 1893, *Tonduz*, October 1894, *Pittier* (Inst. Fís. Geogr. 8433, 9041); Talamaca (*Pittier*); Boruca, fruits February 1891, *Tonduz* (Inst. Fís. Geogr. 4765); Buenos Aires, Diquís basin, fruits February 1891, *Tonduz* (Inst. Fís. Geogr. 3826); Boca Culebra (*Pittier*).

PANAMÁ: Chagres, January 1850 (*Fendler*); Matachín, Canal Zone (*O. Kuntze* 1923) Hospital Grounds at Ancon, Canal Zone, fruits March, 1910 (Col. *Chas. F. Mason*); around Culebra, Canal Zone, leaves only January 15, 1911 (*Pittier* 2423); between Las Cascadas and Bas Obispo, Canal Zone, flowers July 1, 1911 (*Pittier* 3746); Bismarck, above Penonomé, Province of Coclé, fruits March 1908 (*Williams* 383, 584).

29. **Inga panamensis** Seemann. Bot. Voy. Herald 117. 1852–57.

A small tree, the branchlets slender, terete. Rachis of the leaves very narrowly winged below the terminal pair of leaflets, 4 to 8 cm. long, brownish hairy; stipules ovate, acute, 6 to 9 mm. long; glands very small, sessile; leaflets 1 to 3-jugate, petiolulate (the petiolules 4 mm. long), ovate to obovate, obtuse, glabrescent, 7.5 to 15 cm. long, 4.5 to 10 cm. broad, the costa and venules more or less hairy and prominent beneath. Floral spikes single, axillary or terminal, the peduncles striate, sparsely hairy, 1.5 to 3.5 cm. long; bractlets lineal, hairy, 1 to 1.5 cm. long; calyx broad, sparsely hairy, 7 to 8 mm. long; corolla 13 to 15 mm. long, silky pubescent. Legume glabrous, thick, 15 cm. long and over, about 4 cm. broad, the margins very prominent.

PANAMÁ: Near Cruces, Canal Zone, in woods (*Seemann* 407, type); Bismarck above Penonomé, province of Coclé, leaves only March 19, 1908 (*Williams* 589).

30. **Inga Purpusii** Pittier, Contr. U. S. Nat. Herb. **18**: 199. 1916.

Branchlets angular, brownish hairy. Rachis of the leaves densely hairy, 10 to 13.5 cm. long, narrowly winged between the two terminal pairs of leaflets; stipules ovate or oblong, densely pubescent, 7 to 10 mm. long; glands obsolete, or very small and subsessile; leaflets 2 to 3-jugate, briefly petiolulate (the petiolules about 1 mm. long), ovate to oblong, acute or short-acuminate, more or less sparsely hairy all over, reticulate, 10 to 18 cm. long, 5 to 9 cm. broad, the costa and veins more or less pubescent and prominent on both faces. Floral spikes axillary or terminal, the peduncles ferruginous-hairy, 3 to 5 cm. long; bractlets lineal, hairy, 2 to 2.5 mm. long; calyx striate, 17 to 20 mm. long, minutely pubescent; corolla 29 to 32 mm. long, villous. Legume 30 cm. long, more or less, 2.7 cm. broad, glabrous, with thick, rounded margins.

MEXICO: Finca Yolanda, Chiapas, flowers and fruits September 1913 (*C. A. Purpus* 6811, type).

31. **Inga lindeniana** Benth. Hook. Lond. Journ. Bot. **4**: 608. 1845.

A tree; branchlets angular, densely rufous-hirsute. Rachis winged, also rufous-hirsute, the wings attenuate at both ends; leaflets 3-jugate, ample, membranous, subsessile; leaflet blades ovate, acuminate, light green and softly hairy above, velvety beneath, the larger ones, terminal, 23 cm. long 11.5 cm. broad. Floral spikes pedunculate,, the heads oblong; flowers sessile; bracts lineal-lanceolate, caducous; calyx tubular, striate, silky puberulous, 10.6 mm. long; corolla silky villous, 23.3 mm. long. Legume 15 to 30 cm. long or over, 5 to 6.5 cm. broad. densely rufous-villous, thick, flat before maturity, screw-twisted later.

MEXICO: Teapa, State of Tabasco, México (*Linden* 726, type).

32. **Inga Goldmanii** Pittier, Contr. U. S. Nat. Herb. **18**: 198. 1916.

A tree 6 to 10 m. high, with depressed, spreading crown; branchlets angular, the younger growth, the rachis of the leaves and the peduncles densely rufous hairy. Rachis of the leaves winged, 9 to 25 cm. long, the petiolar part 2 to 4 cm. long; stipules heart-shaped, obtuse; glands sessile or stipitate; leaflets 3 to 4-jugate, almost sessile, coriaceous; blades oblique, ovate to oblong, rounded at the base, obtuse or acute at the apex, sparsely villous, the venation impressed above and strongly prominent beneath, 7 to 20 cm. long, 5 to 11 cm. broad. Inflorescences axillary, long pedunculate; calyx 14 mm. long, densely fulvous-pubescent; corolla densely fulvous-hairy, 25 mm. long, the lobes

8 mm. deep, narrow and acute; stamen tube inclosed. Legume flat or twisted, sessile, long stipitate, rounded or subacute at the apex, 20 cm. long or more, 3.5 to 4.5 cm. broad, densely rufous-hispid, the margins rounded and deeply sulcate on the sutural line.

COSTA RICA: In forest at Banana River near Port Limón, leaves only May 1, 1903 (*Cook & Doyle* 429); Río Hondo, plains of Sta. Clara, in pastures; fruits May 1902, *Pittier* (Inst. Fís. Geogr. 16376).

PANAMÁ: Near Gatún, Canal Zone, fruits February 10, 1911 (*E. A. Goldman* 1866, type).

Series d–*Vulpinæ*

Branchlets, leaves and inflorescences hirtous, pilose or setose. Rachis of the leaves winged. Glands small, stipitate. Flower heads subelongate, short or long pedunculate. Bracts caducous.

Flowers sessile or pedicellate; corolla villous.

Floral spikes briefly pedunculate; flowers sessile; medium-sized tree 34. *I. Tonduzii*

Floral spikes long pedunculate; flowers pedicellate; shrub or small tree 35. *I. Cookii*.

33. **Inga Tonduzii** Donnell Smith, Bot. Gaz. **44**: 112. 1907.

A tree with rounded crown; branchlets densely ferruginous-setulous. Rachis of the leaves setulous, winged, 9 to 14 cm. long, the petiolar part naked, 1.5 to 2 cm. long, the wings 1.0 to 1.5 cm. broad, revoluted; stipules deltoid, acuminate, 10 to 12 mm. long, caducous; glands small, briefly stipitate; leaflets 2 to 3-jugate, sessile, coriaceous; blades elliptic or ovate-elliptic, rounded and subemarginate at the base, acuminate, hairy on both faces, 4 to 17 cm. long, 2 to 9 cm. broad. Inflorescences single or geminate in the axils, or 2 to 5-clustered at the end of the branchlets; peduncles densely hairy, about 2 cm. long, the flower-heads elongate, densely flowered; flowers sessile; bractlets lineal-lanceolate, hairy without, subpersistent; calyx 10 to 12 mm. long, sparsely hairy, striate; corolla yellowish white, 27 mm. long, deeply lobulate, villous; stamen tube inclosed; ovary glabrous. Legume flat and thin, sparsely hairy, 15 to 30 cm. long, 3.8 to 4.4 cm. broad, the margin rounded and deeply sulcate along the sutural line.

COSTA RICA: Las Vueltas de Tucurrique, in forest, flowers and fruits December 1898, *Tonduz* (Inst. Fís. Geogr. 12928, type).

34. **Inga Cookii** Pittier, Contr. U. S. Nat. Herb. **18**: 203. 1916. (Pl. XXXI.)

A shrub or small tree, all parts more or less covered with long, brown setulous hairs. Rachis of the leaves winged, 5 to 7.5 cm. long, the petiolar part 0.5 to 1 cm.; stipules ovate, 3 to 4 mm. long; glands small, long stipitate; leaflets 3-jugate, subsessile; the blades ovate to lanceolate, obtuse at the base, acuminate, hairy, ciliate on the margin, 3.5 to 13 cm. long, 2 to 5 cm. broad. Inflorescences axillary, single; peduncles slender, about 8 cm. long; flowers pedicellate; bractlets lanceolate, 2 to 4 mm. long, glabrous inside, subpersistent; pedicels about 2.5 mm. long; calyx tubular, 4 mm. long; corolla tubular, broadened toward the apex, about 11 mm. long, the lobes short and narrow; stamen tube inclosed. Legume not known.

GUATEMALA: Near the Finca Sepacuité, Alta Verapaz, in forest; flowers March 27, 1902 (*Cook & Griggs* 202, type, 226 & 505).

Series e–*Longifloræ*

Rachis of the leaves winged. Glands sessile or very briefly stipitate. Bractlets caducous. Flowers sessile, slender, very long, calyx striate, glabrous, except on the teeth; corolla silky villous. Legume flat or twisted, densely rufous hairy.

35. **Inga mucuna** Walpers & Duchass., Walp. Ann.**2**: 459. 1851-52. (Pl. XXVI.)

A middle sized tree with spreading crown, the branchlets angular, at first ferruginous-hairy. Rachis of the leaves winged, densely brown strigose-hairy, 11 to 22 cm. long, the petiolar part 2.5 to 3.5 cm., the wings 1.7 to 3 cm. broad; stipules heart-shaped, acute, 5 to 8 mm. long, persistent; glands very small, subsessile; leaflets 2 to 3-jugate, membranous, the petiolules hairy, 3 mm. long, the blades ovate-orbiculate to ovate, acute or abruptly acuminate, hairy-strigose above, tomentose-pubescent and reticulate beneath, 6 to 17.5 cm. long, 4 to 11 cm. broad, the terminal pair largest, the costa and veins densely hairy. Floral spikes axillary, single, the peduncles 5 to 8 cm. long, densely brown hairy; flowers sessile; bractlets elliptic, hairy, about 6 mm. long, caducous; calyx striate, 2 cm. long, glabrous except on the teeth tips; corolla slightly broader at the apex, white, villous, 4.5 cm. long, the lobes 7 mm. long or less; stamen tube slender, long exserted; stigma capitellate. Legume flat or screw twisted, sessile, up to 30 cm. long, 5 cm. broad, the margins rounded, the seeds numerous.

PANAMÁ: Panamá, 1850 (*Duchassaing* 81, type); banks of the Sambú River, southern Darien, flowers & fruits February 1, 1912 (*Pittier* 5525).

Series f–*Dysanthæ*

Habit and foliage of the *Euingæ*. Rachis of the leaves (in our species) wingless. Glands sessile. Floral spikes loose or erect; corolla and calyx densely covered with curled, felted hairs. Legume flat, rufous hairy.

36. **Inga standleyana** Pittier, Contr. U. S. Nat. Herb. **18**: 204. 1916.

A low tree with rounded crown, the young branchlets, peduncles, rachis of the leaves and flower heads densely rufous hairy. Rachis of the leaves wingless, terete, 10 to 15 cm. long, the petiolar part 2.5 to 4 cm; glands large, sessile, pertuse; leaflets 4-jugate, subsessile; the blades suboblique, ovate or obovate, rounded at the base, obtuse or acuminate, glabrous except on the costa above, softly villous and prominently veined beneath, ciliate on the margin, 5 to 13 cm. long, 4 to 8 cm. broad. Inflorescences axillary, geminate, elongate; peduncles 2.5 to 4 cm. long; bractlets ovate, very small and caducous; flowers sessile, the calyx and corolla densely tomentose; calyx 5 mm. long, the lobes 3 to 4 mm. deep; stamen tube inclosed, pink, colored as are the filaments; ovary hairy on the sutural lines; style about 5 cm. long. Legume flat and densely rufous hairy.

PANAMÁ: Vicinity of La Palma, southern Darien, in old clearings; flowers, January 26, 1912 (*Pittier* 5496, type).

Section 5. EUINGA

Flowers mostly broader than in *Pseudinga*, sessile in erect spikes, and usually falling off from the base of the spike as this becomes longer. Calyx tubular or sometimes campanulate, often sparsely hairy and longitudinally striate. Corolla silky pubescent or villous. Legume often briefly tomentose, thick, the margins broad, diversely sulcate, straight and impressed between the broad faces or twisted and more or less covering the latter. Indumentum mostly fulvous, rufous or ferruginous. Rachis of the leaves almost always winged. Glands sessile, substipitate or long stipitate, seldom obsolete. Leaflets 2 to 7-jugate. Inflorescences axillary, single or geminate. Flowers mostly over 1 cm. long, hardly ever exceding 2.5 cm.

Series a–*Tetragonæ*.

Legume straight or almost so, with a 4-angled cross-section, the faces broad and smooth, the margins, mostly concave, longitudinally sulcate. Inflorescences axillary, single or, seldom, geminate. Flowers long and slender; ovary 4-sulcate.

Rachis of the leaves winged between the two upper pairs of leaflets only; leaflets 2 or 3-jugate; calyx teeth short and densely hairy 37. *I. biolleyana.*

Rachis of the leaves winged between all the leaflets pairs; calyx teeth mostly long and sparsely hairy.

Leaflets 5–6-jugate. Legume very short (5 cm. long) 38. *I. Calderoni*

Leaflets 3–, mostly 4-jugate, seldom over 13 cm. long

Peduncles of the floral spikes 2 to 2.5 cm. long; bractlets unusually conspicuous, up to 2.2 cm. long; pubescence mostly fulvous and dense 39. *I. Rensoni*

Peduncles of the floral spikes 6 to 10 cm. long; bractlets not very conspicuous, up to 1.4 cm. long; pubescence brownish and never very dense 40. *I. Preussii*

Leaflets 2 to 5, mostly 3-jugate, the terminal pair almost always over 13 cm. long

Legume 1.5 cm. long, more or less 4-angled; leaflets 4–5-jugate, 6–10 cm. long; a shrub; interfoliolar glands substipitate 41. *I. salvadorensis*

Legume seldom less than 9 cm. long

Glands long stipitate; leaflets sparsely hairy beneath; corolla about 32 mm. long 42. *I. jimeneziana*

Glands sessile or briefly stipitate; leaflets softly villous or pubescent beneath; corolla not over 24 mm. long 43. *I. Pittierii*

37. **Inga biolleyana** Pittier, Contr. U. S. Nat. Herb. **18**: 207. 1916.

A small tree. Rachis of the leaves winged only under the upper leaflet pair, or not winged at all, ferruginous-pubescent, 4 to 9 cm. long; stipules broadly ovate, acute, 7 to 9 mm. long, persistent; glands small, briefly stipitate, often obsolete; leaflets mostly 3-jugate, sometimes less, the petiolules 2 to 3 mm. long, the blades ovate-elliptic, acute, sparsely glabrescent above, paler, reticulate and sparsely hairy beneath, 4.5 to 15 cm. long, 2 to 6 cm. broad, the

costa and veins pubescent on both faces and very prominent beneath. Floral spikes single in the upper axils, the peduncles ferruginous-hairy, 1 to 1.5 cm. long; bractlets lineal-lanceolate, 9 to 12 mm. long, persistent; calyx about 11 mm. long, the tube sparsely fulvous-pubescent, the teeth short, densely hairy; corolla tubular, broadening toward the apex, 28 to 31 mm. long, stamen tube long exserted, the filaments purple; ovary 4-sulcate. Legume not known.

COSTA RICA: Turrialba, at an altitude of 750 meters, in pastures; flowers November 1893, *Tonduz* (Ins. Fís. Geogr. 8391, type).

38. **Inga Calderoni** Standley, Journ. Wash. Acad. Sc. **13**: 352. 1923.

Young branchlets densely pilose with short fulvous hairs. Rachis of the leaves 5.5 to 9 cm. long, narrowly winged, densely short-pilose; leaflets 5–6-jugate, narrowly oblong-lanceolate, long-attenuate, obliquely obtuse or rounded at the base, 7 to 10.5 cm. long, 1.5 to 2.2 cm. broad, copiously fulvous-pilose above with subappressed hairs, more densely pilose with mostly spreading hairs beneath. Legume oval-quadrate, strongly compressed, 5 cm. long, 3.5 cm. broad, nearly 1 cm. thick, covered with a dense feltlike tomentum of stiff fulvous hairs.

EL SALVADOR: Comasagua, fruits December 1922 (Dr. S. Calderón No. 1392, type).

The description of this species is too incomplete to permit of its being put with certainly in its right place. The legume would suggest a member of the *Pseudinga-Vulpinæ*, a series not represented heretofore in Central America, but the other characters indicate a close relation with the *Euingae-Tetragonae*.

39. **Inga Rensoni** Pittier, Contr. U. S. Nat. Herb. **18**: 209. 1916.

A medium-sized tree. Rachis of the leaves densely fulvous hairy, winged, 8 to 12 cm. long, subwinged below the basal leaflets; stipules ovate or oblong, obtuse, 6 to 12 mm. long, persistent; glands subsessile, irregular; leaflets mostly 4-jugate, sometimes less, the petiolules 2 to 3 mm. long, densely fulvous-hairy, the blades ovate or ovate-lanceolate, acute, pubescent above, reticulate and tomentose-pubescent beneath, 6 to 13 cm. long, 2.5 to 6 cm. broad, the costa and veins densely fulvous-hairy. Floral spikes single in the axils, the peduncles fulvous-hairy, 2 to 2.5 cm. long; bractlets very conspicuous, lineal-lanceolate or ovate, 1 to 2.2 cm. long, subpersistent; calyx irregular in length (14 to 22.5 mm.) striate, sparsely appressed pubescent; corolla silky villous, 21 to 22 mm. long, the lobes short and obtuse; stamen

tube inclosed. Legume glabrous, substipitate, about 18 cm. long, the faces flat or concave, 3 to 3.5 cm. broad, coming together at the pointed apex, the margin concave, 1 to 2 cm. broad.

EL SALVADOR: Vicinity of San Salvador, in coffee-plantations (*C. Renson* No. 239, type).

40. Inga Preussii Harms, Repert. Sp. nov. **13**: 420. 1914. (Pl. XXVII.)

A tree about 15 m. high. Rachis of the leaves winged except on the petiolar part, brownish-villous, 5 to 13 cm. long; stipules ovate or ovate-lanceolate, tomentose-pubescent without, about 5 mm. long; glands small, subsessile; leaflets 3 to 4-jugate, the petiolules 2 mm. long or less, the blades ovate to ovate-elliptic or oblong, acute or acuminate, sparsely pilous above, reticulate and densely villosulous beneath, 5.5 to 12 cm. long, 2.5 to 7 cm. broad, the costa and veins pubescent on both faces. Floral spikes single or geminate in the axils, the peduncles 6 to 10 cm. long; bractlets lanceolate, acute, 7 to 14 mm. long; calyx villosulous or sparsely hairy, 10 to 12 mm. long; corolla silky villous, about 2 cm. long; stamen tube shortly exserted. Legume sessile, stipitate, glabrous, 21 cm. long, more or less, the faces 2.5 to 3.5 cm. broad, concave, meeting in a rounded apex, the margin concave, 3-sulcate, 1 to 1.5 cm. broad at the base and narrowing toward the apex.

EL SALVADOR: Hacienda Guadalupe near San Salvador, flowers February 1900 (*Preuss* 1386, type); above Izalco, Department of Sonsonate, at an altitude of 800 meters, fruits February 1907 (Pittier 1974).

41. **Inga salvadorensis** Britt. & Rose, North-Amer. Fl. **23**: 12. 1928.

A shrub, the twigs densely brownish-pubescent. Rachis of the leaves winged, densely pubescent, the petiolar part 1–2 cm. long; leaflets 4 to 5-jugate, lanceolate to oblong, acuminate, 6 to 10 cm. long, entirely pubescent, venation very prominent beneath. Floral spikes 4 cm. long. Legume 1.5 cm. long, somewhat flattened, more or less 4-angled, velvety pubescent.

EL SALVADOR: Near San Salvador, 1923 (Dr. S. Calderón 1828).

The main features of this new species would be its reduced size and, above all, its extraordinary fruits. The very incomplete description reproduced above shows that only imperfect specimens have been collected. The legitimacy of this type must be considered doubtful until better and more copious materials are at hand. Its description reminds that of *Inga Calderoni* Standley, cited above.

42. **Inga jimeneziana** Pittier, Contr. U. S. Nat. Herb. **18**: 208 1916.

A tree with rounded crown. Rachis of the leaves narrowly winged, sparsely ferruginous-hairy, 5 to 15 cm. long, the petiolar part terete or hardly marginate; stipules ovate-lanceolate, acute, 1 to 2 cm. long, pubescent, persistent; glands small, mostly long stipitate; leaflets 2 to 3-jugate, seldom 4-jugate, subsessile (i. e. the petiolules not over 1 mm. long), the blades broadly ovate to ovate-elliptic, acuminate, lustrous and sparsely hairy above, reticulate beneath, 7 to 21 cm. long, 3 to 11 cm. broad, the costa and veins fulvous-hairy on both faces. Floral spikes single or geminate in the upper axils, the peduncles fulvous-hairy, 1.5 to 4 cm. long; bractlets lanceolate to lineal, 1 to 1.5 cm. long, persistent; calyx striate, fulvous-pubescent, about 12 mm. long, the teeth narrow and subulate; corolla tubular, broadened at the apex, about 32 mm. long, the lobes short and broad; stamen tube included, the filaments deep purple. Legume sessile, glabrous, 11.5 to 30 cm. long, the faces 3 cm. broad, the margin 1.5 cm. broad, 2-sulcate.

Costa Rica: Banks of Colorado River near Turrialba; flowers and fruits November 1893, *Tonduz* (Inst. Fís. Geogr. 8333, type); Aragón near Turrialba, flowers October 1894, *Pittier* (Inst. Fís. Geogr. 9041); Las Vueltas de Tucurrique, in pastures, flowers and fruits April 1892, *Tonduz* (Inst. Fís. Geogr. 13055).

43. **Inga Pittierii** Micheli, Bull. Herb. Boiss. **2**: 446, pl. 13. 1894.

A small tree. Rachis of the leaves rufous or fulvous pubescent, either terete, marginate or narrowly winged, 6 to 17 cm. long; stipules ovate, oblong or lanceolate, obtuse, 8 to 16 mm. long, subpersistent; glands small, sessile or substipitate; leaflets 3-jugate or seldom less, the petiolules 2 to 4 mm. long, the blades ovate to ovate-elliptic, acute or abruptly acuminate, sparsely scabrous-pubescent or glabrescent above, reticulate and softly pubescent beneath, 6 to 23 cm. long, 2.5 to 11 cm. broad, the costa and veins densely fulvous-pubescent on both sides. Floral spikes single in the upper axils, the peduncles 1 to 4 cm. long, densely fulvous-pubescent; bractlets ovate to lineal-lanceolate, pubescent, 5 to 12 mm. long, subpersistent; calyx 8 to 13 mm. long, pubescent, striate, the teeth subulate; corolla tubular, broadening toward the apex, sparsely appressed villous, 19.5 to 24 mm. long, the lobes narrow, densely villous; stamen tube included or slightly exserted, the filaments pink. Legume sessile, glabrous, 9 to 18 cm. long, the faces and margins about equally (1.5 to 2.5 cm.) broad, joining in a cuspidate apex.

COSTA RICA: Banks of Río Ceibo near Buenos Aires, Diquís basin, flowers and fruits February 1892, *Tonduz,* (Inst. Fís. Geogr. 4977, type); around Sto. Domingo de Osa, in forests, flowers and fruit March 1896, *Tonduz* (Inst. Fís Geogr. 10030); near Juan Viñas, in coffee plantations, fruits April 26, 1903 (*Cook & Doyle* 389).

PANAMÁ: Forests around San Félix, eastern Chiriquí, flowers December 30, 1911, (*Pittier* 5452); Bismarck above Penonomé province of Coclé, fruits March 5–19, 1908 (*Williams* 489).

Series b–*Sulcatæ.*

Fruits assuming more or less the appearance of a piece of rope, the margins entirely or partly covering the faces.

Rachis of the leaves wingless, or winged only between the two upper leaflet pairs.

Leaflets oblong-elliptic; main rachis quite wingless 44. *I. cocleensis.*

Leaflets mostly broadly ovate, sometimes oblong; main rachis often narrowly winged between the two upper pairs 45. *I. eriorhachis.*

Rachis of the leaves winged from the basal leaflets to the apex

Flowers relatively small and slender, the calyx not over 10 mm. long

Leaflets usually 3–4-jugate; floral spikes single, geminate or at the most ternate in the axils of the leaves

Bractlets obtuse, very small; glands very small, corolla 15 to 17 mm. long, the calyx 8 to 10 mm. with short teeth 46. *I. pauciflora.*

Bractlets acute or acuminate, rather large; glands large, concave

Corolla 10 to 12 mm. long, the calyx 5 to 7 mm. 47. *I. Endlichii.*

Corolla 12 to 13 mm. long, the calyx 7–8 mm. 48. I. *latibracteata.*

Leaflets usually 4 to 6-jugate; inflorescences mostly 2 to 6-clustered, and paniculate; glands large

Young branchlets, rachis of the leaves and floral spikes rusty-tomentellose or puberulous; calyx grayish-pubescent 49. *I. edulis.*

Young branchlets, rachis of the leaves and floral spikes densely rubiginous-pubescent; calyx and corolla also rubiginous-hairy 50. *I. oerstediana.*

Flowers relatively large and broad, the calyx not under 10 mm. long

Flowers more or less stipitate; bractlets suborbiculate
51. *I. spuria*

Flowers all sessile; bractlets ovate or lanceolate

Corolla not over 17 mm. long

Leaflets ovate or oblong to lanceolate, 2.5–9 cm. long, 1 to 3.5 cm. broad; interfoliolal glands small; bractlets ovate-lanceolate 6 to 8 mm. long 52. *I. xalapensis*

Leaflets oblong, lanceate-oblong or oblanceate-oblong, up to 17 cm. long and 6.5 cm. broad; interfoliolal glands large; bractlets lanceolate, acute, 8–12 mm. long
53. *I. Sciadondendron*

Corolla not less than 20 mm. long

Calyx not over 15 mm. long

Staminal tube almost equalling the corolla
54. *I. eriocarpa*

Staminal tube long, exceeding the corolla
55. *I. oophylla*

Calyx over 19 mm. long

Corolla 27.5 to 29.5 mm. long; leaflets 3 to 4-jugate, petiolulate 56. *I. rodrigueziana*

Corolla not over 23 mm. long

Leaflets 7-jugate; corolla longer than the calyx; pubescence rufous
57. *I. Donnell Smithii*

Leaftlets 6-jugate; corolla usually shorter than, or equal to, the calyx; pubescence grayish
58. *I. fissicalyx*

44. **Inga cocleensis** Pittier, Contr. U. S. Nat. Herb. **18**: 211. 1916.

A tree, the young branchlets, rachis of the leaves and floral peduncles rubiginous-pubescent. Rachis of the leaves wingless, 18.5 cm. long; glands large, transversally ovate; leaflets 6-jugate, coriaceous, the petiolules 3 to 5 mm. long, thick, densely pubescent, the blades elliptic-oblong, broadly rounded at the base, acuminate, strigose-pilosulous above, densely pubescent and reticulate beneath, 4 to 13 cm. long, 1.5 to 4.5 cm. broad, the costa and veins rubiginous-pubescent, both prominent on the lower face, the latter impressed on

the upper face. Floral spikes single, axillary; peduncles 4 to 5 cm. long; calyx 6 to 7 mm. long, tubular, rubiginous-pubescent, corolla. . . . Legume slender, terete, minutely rubiginous-pubescent, twisted, 10 to 20 cm. long.

PANAMÁ: Bismarck above Penonomé, province of Coclé, at an altitude of 700 to 1000 meters, fruits March 1908 (Williams 405, type).

45. **Inga eriorhachis** Harms, Repert. Sp. nov. **13**: 525. 1915.

A middle-sized tree, the young branchlets, rachis of the leaves and floral peduncles densely ferruginous-pubescent. Rachis of the leaves wingless or narrowly winged between the two upper pairs of leaflets, 12 to 16 cm. long; stipules very caducous; glands obsolete; leaflets 4 to 5-jugate, coriaceous, the petiolules 1 to 2 mm. long, the blades ovate or oblong, obtuse or rounded at the base, obtuse or shortly acuminate at the apex, 8 to 17 cm. long, 5 to 11 cm. broad, more or less villosulous on both faces, sublustrous above, paler and reticulate beneath, the costa and veins densely ferruginous-pubescent. Floral spikes 2 to 5-clustered in the upper axils, the peduncles 4 to 6 cm. long, the flower heads spiciform, 4 to 6 cm. long; flowers sessile; bractlets obovate, 3 to 4 mm. long, very caducous; calyx tubular, ferruginous-villous, 6 to 8 mm. long; corolla 11.5 to 14.5 mm. long, ferruginous-villous. Legume not known.

COSTA RICA: Hacienda Belmira, near Santa María de Dota, at an altitude of 1450 meters; flowers January 1898, *Tonduz* (Inst. Fís. Geogr. 11636, type).

46. **Inga pauciflora** Walp. & Duchass., Bot. Syst. **2**: 460. 1848–50.

A bushy shrub, about 3 m. high; young branchlets, rachis of the leaves and floral peduncles ferruginous-hairy or pubescent. Rachis of the leaves 4.5 to 8.5 cm. long, winged except on the very short petiolar part; stipules ovate, obtuse, about 4 mm. long; glands very small, subsessile; leaflets 2 to 4, mostly 3-jugate, coriaceous, the petiolules about 1 mm. long, the blades ovate to ovate-elliptic or obovate, obtuse or acuminate, 2 to 13 cm. long, 1.5 cm. broad, appressed-pilosulous above, villous-tomentose beneath, the costa and veins impressed on the upper face, densely villous-tomentose and prominent on the lower face. Floral spikes single or geminate in the upper axils, the peduncles 1.5 to 2 cm. long; bractlets ovate, obtuse, very small and caducous; calyx ferruginous pubescent, 8 to 10 mm. long; corolla white, silky hairy, 15 to 17 mm. long; stamen tube included. Legume not known.

PANAMÁ: Panamá (*Duchassaing*, type); Ancon Hill, Canal Zone, at an altitude of about 200 meters; flowers February 20, 1908 (*Williams* 32).

47. **Inga Endlichii** Harms, Repert. Sp. nov. **19**: 63. 1923.

A tree with the branchlets more or less angulous, shortly villous. Rachis of the leaves villosulous, rather broadly winged between the leaflets pairs, 6 to 12 cm. long, the petiolar part 2 to 3.5 cm., wingless; glands large, concave; leaflets 3-jugate, oblong, obovate or ovate, 6 to 15 cm. long, 3 to 8 cm. broad, the base rounded or slightly emarginate, the apex shortly acuminate, the upper face at first puberulous and later glabrescent, with the midrib hairy, the lower face villous or pilosulous, and reticulate. Floral spikes geminate or ternate in the axils, 3.5 cm. long; the peduncles short; flowers sessile; bractlets large, oval or oval-oblong, villous, 3 to 7 cm. long; calyx short, 5 to 7 mm. long, villosulous, more or less striate; corolla thickly silky-villous, 10 to 12 mm. long.

MEXICO: Vicinity of Jalapa, 1410 m., Veracruz, in gardens and hedges; flowers February 1907 (R. *Endlich* 1536, type, in Berlin bot. Museum).

48. **Inga latibracteata** Harms, Repert. Sp. nov. **19**: 64. 1923.

A tree, the branchlets more or less angulous, ferruginous-velvety. Rachis of the leaves 7 to 9 cm. long, rather broadly winged between the leaflet pairs; glands large, concave; leaflets 3 to 4-jugate, 6 to 13 cm. long and 3 to 6 cm. broad, oval-oblong-lanceolate, the base more or less oblique and rounded, the apex acute or acuminate, the upper face sparsely pilose, with the midrib villous, the lower face more densely villous and reticulate. Floral spikes 3 to 5 cm. long, densely velvety-villous; bractlets large, ovate to oval-lanceolate, acute or acuminate, densely villous, 9 to 13 mm. long; calyx densely villous, 7 to 8 mm. long; corolla densely hairy, 12 to 13 mm. long or more.

MEXICO: Hills near Jalapa, 1,300 meters, Veracruz, flowers April 1899 (*Pringle* 8159, type, in Berlin bot. Museum).

With the author, I feel inclined to consider these two types as mere variations of a single species. They are so very closely related indeed, that it is hard to understand how, in the *North American Flora*, the first happens to be placed within the relationship of *Inga leptoloba*, and not with the second in the group of *Inga xalapensis* or *I. spuria*. The latter species (*I latibracteata*) had been placed by myself, in 1916 under *I. edulis*.

49. **Inga edulis** Mart. Herb. Fl. bras. **113.** (Pls. XXVIII, XXIX, XXX.)

A tree 8 to 20 m. high, the indumentum of the branchlets, rachis of the leaves & floral peduncles, ferruginous. Rachis of the leaves tomentellose, usually winged, 6.4 to 14 cm. long; stipules oblong, obtuse, about 5 mm. long, very caducous; glands large, transversally oblong, sessile; leaflets 3 to 6-jugate, mostly 4-jugate, subcoriaceous, the petiolules tomentellous, about 2 mm. long, the blades ovate or obovate to elliptic, broadly rounded at the base, acute or acuminate, 4 to 19 cm. long, 2 to 10 cm. broad, more or less sparsely pilosulous or glabrescent and sublustrous above, paler and more or less minutely hairy beneath, the costa and veins ferruginous-tomentose, the latter slender and impressed on the upper face, the costa, veins and transverse venules prominent on the lower face. Floral spikes single or 2 to 6 clustered in the upper axils, the peduncles 2 to 3 cm. long, densely tomentellous; bractlets ovate to lanceolate, shorter than the calyx, deciduous; flowers sessile; calyx grayish appressed-pubescent, 6 to 7 mm. long; corolla subcampanulate, silky villous, 15 to 16 mm. long; stamen tube briefly exserted, Legume funiculiform, straight or helicoidally curved, ferruginous tomentose, 30 to 75 cm. long and over, 2 cm. in diameter and over, the sulcate margins almost entirely covering the faces; the peduncles thick, 4 to 5 cm. long.

MEXICO: Near Orizaba, Veracruz (*Mueller* 708 and 2208); Jalapa, Veracruz (*Schiede*); near Misantla, Veracruz, flowers March 1892 (*Schiede*).

GUATEMALA: Setzimaj, Alta Verapaz, flowers March 19, 1902 (*Cook & Griggs* 50; photo. 3641); around Sepacuité, Alta Verapaz, flowers March 27 and April 15, 1902, and May 1904 (*Cook* 124, 228, 620; photo. 3751) (habit of tree) and 3750 (leaf and inflorescence); Cobán, Alta Verapaz, flowers May 1907 (*von Tuerckheim* II, 1774); near Esperanza, western Guatemala, flowers January 19, 1905 (*Maxon & Hay* 3355).

COSTA RICA: San José, in coffee plantations, flowers May 1888 *Pittier* (Inst. Fís. Geogr. 233 bis); Térraba, in forest, flowers February 1891, *Tonduz* (Inst. Fís. Geogr. 3825); Guácimo, llanos de Santa Clara, young fruits (*Tonduz* 148, United Fruit Co's. Herbarium, in U. S. Nat. Herbarium); Las Cóncavas, near Cartago, in coffee plantations, flowers April 7, 1903 (*Cook and Doyle* 19 and 20); Las Vueltas de Tucurrique, Reventazón Valley; flowers and young fruits November 1898, *Tonduz* (Inst. Fís Geogr. 12745); Suerre, llanos de Santa Clara, fruits April

1896 (*Donnell* Smith 6991); forests of Xirores, Talamanca, flowers February 1895, *Tonduz* (Inst. Fís. Geogr. 9357); Boruca, Diquís basin, December 1891, *Tonduz* (Inst. Fís. Geogr. 4710).

PANAMÁ: Between Gorgona & Mamei, Canal Zone; flowers February 9, 1911 (*Pittier* 2696).

50. **Inga oerstediana** Benth. in Seemann, Bot. Voy. Herald: 117. 1852–57.

A middle-sized, spreading tree; branchlets, rachis of the leaves, petiolules, costa and veins of the leaves, and floral peduncles densely rubiginous-pubescent. Rachis of the leaves winged, 10 to 15 cm. long; glands obsolete or, when present, large and transversally ovate; leaflets 3 to 5-jugate, subcoriaceous, the petiolules 2 to 4 mm. long, the blades oblique or suboblique, ovate to elliptic, obtuse or acute at the apex, 4 to 15 cm .long, 2.5 to 7.5 cm. broad, softly pubescent of glabrescent above, more or less densely tomentose and reticulate beneath, the veins impressed on the upper face, the costa and veins prominent on the lower face. Floral spikes single or 2 to 5-clustered in the upper axils; flowers sessile; bractlets very small and caducous; calyx 4 to 8 mm. long, rubiginous-pubescent; corolla tubular, broadening toward the apex, 14 to 16 mm. long, rubiginous-villous; stamen tube equal to the corolla. Legume funiculiform, long, more or less twisted, the margins, deeply sulcate, almost entirely covering the faces.

MEXICO: Sine loc. (*Mueller* 708, coll. 1853).

COSTA RICA: Candelaria Mountains (*Oersted*); El Copey, Dota Mountains, in forests, flowers February 1898, *Tonduz* (Inst. Fís. Geogr. 11683); banks of Río Ciruelas above Barba, flowers March 15, 1890, *Tonduz* (Inst. Fís. Geogr. 2236); near San José, flowers May 2, 1890, *Pittier* (Inst. Fís. Geogr. 2372).

PANAMÁ: El Boquete de Chiriquí (*Seemann*, type); in pastures near El Boquete, Chiriquí, at an altitude of about 1100 m., flowers March 16, 1911 (*Pittier* 3130).

51. **Inga spuria** Humb. & Bonpl., Willd. Sp. Pl. 4: 1011. 1806.

A small tree; branchlets grayish or brownish-pubescent. Rachis of the leaves grayish or brownish pubescent, winged, 10 to 17 cm. long; stipules deciduous; glands orbiculate, sessile; leaflets 5 to 7-jugate, subcoriaceous, the petiolules not over 1 mm. long, the blades ovate to elliptic-oblong, acute or subacuminate, or sometimes obtuse, 4.5 to 17 cm. long, 2 to 8 cm. broad, hirtellous or glabrescent and sublustrous above, reticulate and glabrescent to softly tomentose be-

neath, the costa and veins pubescent, strongly prominent on the lower face. Floral spikes axillary and mostly geminate, or terminal and 2 to 4-clustered in the upper axils, the peduncles hairy, 3 to 5.5 cm. long; flowers sessile; bractlets ovate, 5 to 6 mm. long, caducous; calyx more or less stipitate, broad, substriate, pubescent, 10 to 11.5 mm. long; corolla broad, silky hairy, greenish or yellowish white, 15 to 19 mm. long, the lobes reflected; stamen tube almost equal to the corolla. Legume more or less funiculiform, stipitate, cuspidate, softly brownish-pubescent, 5 to 30 cm. long, 1 to 1.5 in diameter, the sulcate margins more or less expanded over the faces.

Type from VENEZUELA, without precise locality (*Humb. & Bonpl.*)

MEXICO: Santa Lucrecia, Isthmus of Tehuantepec, flowers March 29, 1895 (*C. L. Smith* 991); San Luis, Guerrero, flowers March 1899 (*Langlassé* 932); between Puerto Angel and Pochutla, Oaxaca, flowers March 15, 1895 (*E. W. Nelson* 2461); Catemaco, Veracruz, flowers April 26, 1894 (*Nelson* 425); Gómez Farias, Tamaulipas, flowers April 1907 (*Palmer* 290); La Palma, Jalisco, flowers June 9, 1892 (*M. E. Jones* 183); Acapulco, Guerrero, flowers October 1895 (*Palmer* 250); vicinity of Tampico, Tamaulipas, flowers June 1910 (*Palmer* 568); vicinity of Panuco, Veracruz, flowers April 1910 (*Palmer* 362); valley of Los Reyes, Michoacán, flowers February 7, 1903 (*Nelson* 6844); Tamasopo Cañón, San Luis de Potosí, flowers June 9, 1915 (*Pringle* 5048); near Cuernavaca, Morelos, flowers May 27–30, 1899 (*Rose* and *Hough* 4361).

GUATEMALA: Boca del Cahabón, Izabal, flowers April 1889 (*Donnell Smith* 1673); San Juan Mixtán, Escuintla, alt. 107 m. flowers April 1890 (*Donnell Smith* 2317); Laguna de Ayarza, Jalapa, fruits September 1892 *Heyde & Luz* (Donnell Smith 3727); Cubilquitz, Alta Verapaz, flowers May 1901, *von Tuerckheim* (Donnell Smith 7854); Gualán, Izabal, flowers and fruits January 14, 1905 (*C. Deam* 380); road from Secanquím to Cahabón, leaves only March 30, 1902 (*Cook & Griggs* 337); Patulul, Sololá, flowers February 14, 1906 (*Kellerman* 5883).

BRITISH HONDURAS: Near Manatee Lagoon, in forest, flowers, March 9, 1906 (*Peck* 374).

EL SALVADOR: Near Izalco, Sonsonate, flowers February 14, 1907 (*Pittier* 1892).

NICARAGUA: Sine data (*Wright*).

COSTA RICA: Banks of Río Virilla near La Uruca, flowers July 1888, *Pittier* (Inst. Fís. Geogr. 358); Los Desamparados, flowers April 1887, *Biolley* (Inst. Fís. Geogr. 1018); Salinas Bay, Guanacaste,

in forest, flowers and fruits July 7, 1890, *Pittier* (Inst. Fís Geogr. 2726); Echeverría, Alajuela, flowers May 25, 1890, *Pittier & Tonduz* (Inst. Fís. Geogr. 2515); banks of the Ceibo River near Buenos Aires, Diquís Valley, flowers January 1892, *Tonduz* (Inst. Fís. Geogr. 3837); forests of Buenos Aires, Diquís valley, flowers January 1892, *Tonduz* (Inst. Fís. Geogr. 4988); San Francisco de Guadalupe, in hedges, flowers and fruits June 1893, *Tonduz* (Inst. Fís. Geogr. 8049); vicinity of Nicoya, flowers March 1900, *Tonduz* (Inst. Fís. Geogr. 13855); Boruca, Diquís Valley, in forest, flowers February 1891, *Tonduz* (Inst. Fís. Geogr. 3837); El Coyolar, near San Mateo, flowers (*Wercklé*).

PANAMÁ: Gatún railroad station, Canal Zone, flowers October 25, 1859 (*Hayes* 78); Panamá (*Seemann* 520); vicinity of Penonomé, province of Coclé, flowers February and March 1908 (*Williams* 137 and 334; Las Sabanas near Panamá City, flowers January 25, 1911, (*Pittier* 2538); along the Trinidad River, Canal Zone, flower July 20, 1911 (*Pittier* 3973).

52. **Inga xalapensis** Benth., Hook. Lond. Journ. Bot. **4**: 616. 1845.

A small tree, the younger growth more or less ferruginous-pubescent. Rachis of the leaves narrowly winged, at first ferruginous-pubescent and then glabrescent, 5 to 12 cm. long or more; glands small, concave, prominent; leaflets usually 5-jugate, sometimes less, or more, coriaceous, subsessile, the blades ovate or oblong to lanceolate, obtuse or acute, 2.5 to 9 cm. long, 1 to 3.5 cm. broad, sparsely pubescent or glabrescent and sublustrous above, reticulate and more or less densely ferruginous-pubescent to glabrescent beneath, the petiolules, costa and veins densely pubescent, the veins slender and impressed on the upper face, the costa and veins very prominent beneath. Floral spikes usually geminate, more or less densely paniculate at the end of the branchlets, the peduncles 2 to 4.5 cm. long, densely ferruginous-hairy; flowers sessile; bractlets ovate-lanceolate, 6 to 8 mm. long; calyx broad, the more so toward the apex, densely ferruginous-pubescent, 10 to 11.5 mm. long; corolla silky villous, 14.5 to 17 mm. long; stamen tube included, much shorter than the corolla. Legume 10 to 15 cm. long, more or less flattened or subterete, 1 to 1.5 cm. broad, more or less stipitate, cuspidate, densely velvety ferruginous, the faces narrow between the broad, obscurely sulcate margin.

MEXICO: Jalapa, Veracruz (*Linden* 671 type); Wartenberg near Tantoyuca, Veracruz, 1858 (*Ervendberg* 10); Córdoba Valley, Veracruz, flowers March 12, 1866 (*Bourgeau* 2040); Huejutla,

Hidalgo, flowers April 1888 (*Seler* 894); between Salpa and Mascota, Jalisco, flowers March 13, 1897 (*E. W. Nelson* 4042); Orizaba, Veracruz (*Botteri*); Acaponeta, Tepic, flowers February 1895 (*F. H. Lamb* 536); San Pedro near Guadalajara, Jalisco, flowers February 25, 1907 (*Safford* 1414); Villa Unión, Sinaloa, flowers April 2, 1910 (*Rose, Standley & Russell* 13968).

GUATEMALA: Laguna de Amatitlán, flowers January 20, 1906 (*Kellerman* 6374):

COSTA RICA: Banks of Tirribí, near San José, fruits June 1891, *Pittier* (Inst. Fís. Geogr. 4258); La Verbena near San José, in woods, flowers, December 1894, *Tonduz* (Inst. Fís. Geogr. 9078).

53. **Inga Sciadodendron** Harms ,Repert. Sp. nov. **19**: 62. 1923.

A tree, the branchlets rather thin, thickly villous. Rachis of the leaves villous, more or less broadly winged between the leaflet pairs, 15 to 20 cm. long, the petiolar part wingless, 3 to 6 cm. long; glands large, concave; leaflets 4-jugate, oblong, oblong-lanceolate or oblong-oblanceolate, acuminate, the larger ones up to 17 cm. long or more, 6.5 cm. broad, almost glabrous above, more or less pilose beneath. Floral spikes geminate or solitary in the axils, the peduncles rather thin, villosulous, 6–10 cm. long or more; flowers sessile; bractlets lanceolate, acute, pilose, 8–12 mm. long; calyx rather narrow, appressed-pilose, 10–11 mm. long, corolla silky villous, 15 mm. long or more.

MEXICO: Mirador, Veracruz, flowers April 1921 and 1922 (*J. A. Purpus* 279, type in Berlin bot. Museum).

Inga Sciadodendron Harms, is a member of the complex of forms grouped around *Inga xalapensis,* or more widely speaking, around *Inga spuria.* In presence of the extreme variability which characterizes the whole group, it is difficult to fix a definite limit to these so-called species, or to emit a judgment as to the value of any of them. Rather than to multiply them *ad infinitum* it may be preferable to consider *I. spuria* as the type species and to divide it into a few varieties, each one with a broad scope of characters.

54. **Inga eriocarpa** Benth., Hook, Lond. Journ. Bot. **4**: 615. 1845.

A small tree, the younger growth, rachis of the leaves and inflorescences densely fuliginous or brown hairy. Rachis of the leaves broadly winged, 10 to 12.5 cm. long; stipules ovate-lanceolate, 5 to 10 mm. long, deciduous; glands orbiculate, concave, sessile; leaflets 5, seldom 4 or 6-jugate, coriaceous, the petiolules 1 mm. long or less, the blades suboblique, ovate, subacute, 1.5 to 8.5 cm. long, 0.7 to

3.5 cm. broad, glabrescent or sparsely appressed hairy above, softly hairy and subreticulate beneath, the costa and veins densely fulvous hairy, strongly prominent on the lower face. Floral spikes paniculate at the end of the branchlets, sometimes sessile, but the peduncles mostly 1.5 to 2.5 cm. long; flowers sessile; bractlets ovate, fulvous hairy, about 8 mm. long, caducous; calyx turbinate, thickly fulvous hairy, 13 to 14 mm. long; corolla tubular-funnelform, silky-villous, 20 to 22 mm. long; stamen tube almost equal to the corolla. Legume subterete, sulcate, densely tomentose.

Mexico: Between San Blas and Guadalajara, Tepic or Jalisco (*Coulter*); Cuernavaca, Morelos (*Bilimek* 136); Orizaba, Veracruz, flowers March 15, 1867 (*Bilimek* 127); Monte de Santa Inés, Michoacán, flowers March 17, 1898 (*Langlassé* 34).

55. **Inga oophylla** Riley, Kew Bull. **1923**: 401. 1923.

A small tree?, the branchlets ferruginous-tomentose, covered with prominent lenticels. Rachis of the leaves narrowly winged (the wings 7–9 mm. broad), ferruginous-tomentose, 16 cm. long; glands whitish; leaflets 4 or 5-jugate, ovate or oval-lanceolate, obliquely subcordate at the base, obtuse or subacute and long-mucronate at the apex, 5.5 to 12.5 cm. long, 3 to 5 cm. broad, smooth and lustrous above, opaque below and sparsely villous all over. Floral spikes loose, 6 or 7 cm. long, few flowered; flowers sessile; bractlets ovate or oval-lanceolate, obtuse, ferruginous-tomentose, 5 to 7 mm. long; calyx tubulous-campanulate, 18 mm. long; corolla 25 mm. long, densely silky without, glabrous within; stamen tube long-exserted; ovarium sessile, quadrangular, glabrous. Legume not known.

Mexico: San Ignacio, at El Bosque, 110 m., Sinaloa (*González* 250 in Kew Herb., type)

The note appended after *I. Sciadodendron* also applies here, as well as to *I. eriocarpa* and other allied forms. According to its author, *Inga oophylla* differs from *I. eriocarpa* in its ovate or oval-lanceolate leaflets, long, mucronate at the apex, and in its more sparse indument; from *I. xalapensis* it is distinguished by the shape of the leaflets, the lighter indumentation, the smaller bracts, the inflorescences much looser and the fewer flowers.

56. **Inga Rodrigueziana,** Pittier, Contr. U. S. Nat. Herb. **18**: 209. 1916.

A tree. Rachis of the leaves winged, densely ferruginous-pubescent, 13 to 19 cm. long, the petiolar part terete or submarginate; stipules ovate, obtuse, pubescent, about 7 mm. long, deciduous;

glands subsessile, flattened at the apex; leaflets usually 3, often 4-jugate, large, coriaceous, the petiolules 2 to 5 mm. long, the blades elliptic-ovate or lanceate, broadly rounded at the base, acute or acuminate, sparsely villous above, reticulate and villous beneath, 10 to 21 cm. long, 5 to 10 cm. broad, the costa and veins densely ferruginous-pubescent, prominent on the lower face. Floral spikes single in the axils, the peduncles thick, hairy, 5 to 7 cm. long; bractlets lineal-lanceolate, pubescent, 10 to 18 mm. long, subpersistent; calyx densely silky villous, 27.5 to 28.5 mm. long; stamen tube about equal to the corolla; stigma subpeltate. Legume funiculiform, about 15 cm. long and 1.5 cm. in diameter, densely rufous-pubescent, the sulcate margins broad, inclosing the narrow, about 7 mm. broad, faces of the valves.

MEXICO: Tapachula, Chiapas; flowers, Nov. 15, 1918 (*Wilson Popenoe*).

GUATEMALA: Las Viñas, Department Santa Rosa, flowers, September 1893, *Heyde and Luz* (Donnell Smith 6095, type); Cubilquitz, Alta Verapaz, flowers, March 1901, *von Tuerckheim* (Donnell Smith 7855); El Rancho, Department Jalapa, flowers, January 12, 1908 (*Kellerman* 7670).

57. **Inga Donnell Smithii** Pittier, Contr. U. S. Nat. Herb. **18**: 211. 1916.

A tree, the younger growth, rachis of the leaves, peduncles, etc., densely rufous-hairy. Rachis of the leaves thick, winged, 11 to 18 cm. long; stipules ovate, rufous-hairy, about 4 mm. long, caducous; glands small, subsessile, suborbiculate; leaflets 7-jugate, coriaceous, the petiolules dark, very short, the blades oblique, oblong, acuminate, 4 to 14 cm. long, 1 to 3 cm. broad, sparsely appressed-hairy on both faces, dark green above, paler and reticulate beneath, the costa prominent and densely rufous-hairy on the lower face. Floral spikes single, axillary, few-flowered; flowers large, sessile; bractlets ovate, acute, 6 to 10 mm. long, early deciduous; calyx thick, slightly broadening toward the apex, densely rufous-hairy, 19 to 21 mm. long; corolla densely rufous-hairy, about 22 mm. long; the lobes ovate, acute, reflected; stamen tube included, the stamens about 7 cm. from the base; ovary villous at the base. Legume not known.

GUATEMALA: El Guarda Viejo, near Guatemala City; flowers February 1890 (*Donnell Smith* 2316, type).

58. **Inga fissicalyx** Pittier, Contr. U. S. Nat. Herb. **18**: 213. 1916.

A tree, the younger growth, rachis of the leaves and floral

peduncles more or less densely covered with a brown, hirtellous pubescence. Rachis of the leaves narrowly winged, 11 to 14 cm. long; stipules ovate, subacute, 10 to 12 mm. long, 7 mm. broad, caducous; glands small, sessile, orbiculate or transversally ovate; leaflets 5, usually 6-jugate, coriaceous, the petiolules densely brown hairy, 2 to 3 mm. long, the blades lanceolate or oblanceolate, narrow and rounded at the base, acute, 2.5 to 11 cm. long, 1.5 to 3.5 cm. broad, sparsely appressed hairy above, softly hairy and reticulate beneath, the costa and veins densely brownish pubescent, prominent on the lower face. Floral spikes axillary, geminate, the peduncles 5 to 7 cm. long; flowers sessile; bractlets lanceolate, subacute, pubescent, about 10 mm. long, caducous; calyx narrow at the base and broader at the apex, 20 to 28 mm. long, densely fuliginous-pubescent, the teeth very long, narrow and pointed; corolla gradually broadening to the apex, softly villous, 18 to 23 mm. long, the lobes short and broad, reflected; stamen tube equal to the corolla. Legume not known.

MEXICO: Vicinity of Zacualpán, Veracruz, flowers May 1906 and 1909 (*Purpus* 1917 and 3684, type); banks of the Curahueso Creek near San Juan Bautista, Tabasco, flowers November 2, 1887 (*Rovirosa* 27).

GUATEMALA: Eastern Guatemala (*Brigham* in Gray Herbarium).

DISTRIBUTION OF THE MIDDLE AMERICAN SPECIES

Up to the present date (June 1929), about 240 species of *Inga*, or forms described as such, have been listed. Of these, 58, or about one fourth of the total number, have been reported from Middle America. Since this territory also corresponds to the northernmost part of the area occupied by the genus, it follows, that the dispersion center should be looked for in South America. The presence in the West Indies of three species (*I. dominicensis, martinicensis* and *punctata*) of the *Gymnopodae*, besides of *I. laurina* (Sect. *Bourgonia*) and *I. vera* and *ingoides* (*Euinga* ser. *Sulcatæ*) is perhaps an indication of the existence of the genus before the geological dislocation which brought about the separation of the islands from continental South America. It would also point to the antiquity of the three sections in reference.

In the following table, we have tried to give a general idea of the horizontal and vertical distribution of the Middle American species of *Inga*. As only two species (*I. laurina* and *punctata*) extends to the West Indies, and none of them reaches the Andine belt, we have omitted the corresponding columns.

Species	Horizontal Distribution				Vertical Distribution			
					Watersheds		Altitudinal Range Belts	
	Middle & South America	South Central America	North Central America	Mexico	Atlantic	Pacific	Basal 0-1000 m.	Middle 1000-2600 m.
Sect. 1-LEPTINGA								
1 Inga portobellensis	.....	—	.....	.....	—	—	0-100 m.	
2 — gracilipes	.....	—	.....	.....	—	.....	0-100 m.	
3 — saffordiana	.....	—	.....	.....	.....	—	500 m.	
4 — Williamsii	.....	—	.....	.....	—	.....	—	
5 — roussoviana	.....	—	—	.....	—	—	0-100 m.	
Sect. 2—DIADEMA								
6 Inga membranacea	.....	—	.....	.....	.....	—	—	
7 — Peckii	.....	.....	—	.....	—	.....	0-100 m.	
8 — Jinicuil	.....	.....	.....	—	—	.....	—	to 1400 m.
9 — Paterno	.....	—	—	—	.....	—	—	to 2000 m.
10 — radians	.....	.....	—	—	.....	—	—	to 1650 m.
Sect. 3—BOURGONIA								
11 Inga marginata	—	—	.....	.....	—	—	50-800 m.	
12 — laurina	—	—	—	—	.....	—	—	to 1470 m.
Sect. 4—PSEUDINGA								
Series 2—*Gymnopodae*								
13 Inga brevipedicellata	.....	.....	.....	—	—	.....	to 1000 m.	
14 — leptoloba	.....	—	—	—	—	—	—	to 1500 m.
15 — punctata	—	.....	—	—	—	—		
16 — pinetorum	.....	.....	—	.....	—	.....	from 0 to 0-300 m.	1500 m.
17 — ruiziana	—	—	.....	.....	—	—	0-100 m.	
18 — Recordii	.....	.....	—	.....	—	.....	0-100 m.	
19 — aestuarium	.....	—	.....	.....	.....	—	0-200 m.	
20 — multijuga	.....	—	—	.....	—	.....	0-1000 m.	
Series 3—*Pilosiusculae*								
21 Inga Hayesii	.....	—	.....	.....	.....	—	0-100 m.	
22 — Turckheimii	.....	.....	—	—	—	.....	.....	to 1450 m.
23 — monticola	.....	—	.....	.....	.....	—	—	1450 m.
24 — cobanensis	.....	.....	—	.....	—	.....	.....	to 1300 m.
25 — mollifoliola	.....	—	.....	.....	.....	—	.....	1330 m.
26 — Pringlei	.....	.....	.....	.....	—	.....	.....	1200 m.
27 — micheliana	.....	.....	—	.....	.....	—	.....	
Series 5—*Longiflorae*								
28 Inga Mucuna	.....	—	.....	.....	.....	—	0-100 m.	

NOTE: The straight line indicates the presence of the species in that part of America; the dotted line its absence.

Species	Horizontal Distribution				Vertical			
					Watersheds		Altitudinal Range Belts	
	Middle & South America	South Central America	North Central America	Mexico	Atlantic	Pacific	Basal 0–1000 m.	Middle 1000–2600 m.
Series 6—*Calocephalae*								
29 Inga spectabilis		—			—	—	0–800 m.	
30 — panamensis		—			—	—	—	
31 — Purpusii			—				—	
32 — lindeniana			—		—		—	
33 — Goldmanii		—			—		0–800 m.	
Series 7—*Vulpinae*								
34 Inga Tonduzii		—			—		0–600 m.	
35 — Cookii			—		—		0–800 m.	
Series 8—*Dysanthae*								
36 Inga standleyana		—				—	0–50 m.	
Sect. 5—EUINGA								
Series 1—*Tetragonales*								
37 Inga biolleyana		—			—		750 m.	
38 — Calderoni			—			—	—	
39 — Rensoni			—			—	400–800 m.	
40 — Preussii			—			—	400 m.	
41 — salvadorensis			—		—		600 m.	
42 — jimeneziana		—			—	—	0–1000 m.	
43 — Pittieri		—			—	—		
Series 2—*Sulcatae*								
44 Inga cocleensis		—				—	—	1450 m.
45 — eriorhachis		—				—		
46 — pauciflora		—				—	200 m.	1410 m.
47 — Endlichii				—	—			1300 m.
48 — latibracteata				—	—	—	—	to 1100 m.
49 — edulis	—	—	—	—	—	—	—	to 1200 m.
50 — oerstediana		—		—	—	—	from 0	to 1100 m.
51 — spuria	—	—	—	—	—	—	—	to 1200 m.
52 — xalapensis		—		—	—		—	
53 — Sciadodendron				—	—	—	—	to 1000 m.
54 — eriocarpa				—	—	—	110 m.	
55 — oophylla						—	—	to 1100 m.
56 — rodrigueziana			—		—			1200 m.
57 — Donnell Smithii			—		—		—	
58 — fissicalyx			—	—	—			

From the table, the following main conclusions can be deducted:

Horizontal Distribution.

Six of the Middle American species, all of them old and well defined types, extend to South America. Of them two (*I. punctata* and *I. laurina*), are also common to the West Indies. Two more species (*I. marginata* and *I. ruiziana*) only are found at the extreme southern end of our territory, and *I. punctata* does not seem to go beyond the isthmus of Tehuantepec. The three remaining species (*I. laurina, edulis, spuria*) are widely scattered all over the continental area of the genus.

Of the twelve remaining Mexican species, three (*I. Paterno, leptoloba* and *xalapensis*), all well characterized types, extend over the whole area of Middle America, one *(I. fissicalyx)* reaches Northern Central America, and the remaining seven are local forms which, with the exception of *Inga Jinicuil*, are possibly only varieties of other listed species.

Forty-one species belong exclusively to Central America with but two (*I. roussoviana, multijuga*) common to both the northern and the southern sections. Of the remaining thirty nine, fifteen are localized in the North, and twenty-nine in the South, it being understood that the first section includes, besides the part of Mexican political territory south of Tehuantepec, British Honduras, Guatemala, Salvador, and Honduras, and the last one Nicaragua, Costa Rica and Panamá.

The third part of the species thus localized belong to *Euinga*. Several of them, when better known, may posibly be reduced to the condition of simple varieties of well established types.

The large number of forms reported from Middle America as compared with Mexico points to an increased endemism, and the comparison between North and South Central America shows that this becomes stronger as we progress toward our southernmost limit.

As we have seen, 58 out of the 240 species or forms of Inga known up to date occur in Middle America. In every sectional or serial division of the genus they constitude a minority, except in the case of series *Tetragonæ* of *Euinga*, in which seven out of a total of fourteen species have been found north of the isthmus of Darien only. The series *Sulcatæ* has 15 out of its 31 species represented in Middle America. It would seem likely, therefore, that, though on the whole *Inga* is an essentially South American genus, the section *Euinga* has found in Middle America conditions very favorable to the development of local types. It may even be assumed that the series *Tetragonæ* can claim Central America as its cradle. Of course,

such hypothesis may be deeply modified in the course of further investigations.

With regard to the distribution according to watersheds of the Inga species listed for Middle America, we find that fourteen of them are found both on the Pacific and the Atlantic slopes, and the remaining forty-four are equally divided between both.

VERTICAL RANGE

Many species or forms are known from one station only and so we remain in the dark with reference to their altitudinal range. Of the others, about twenty five are restricted to the lower belt, and twenty one reach more or less high into the middle one. *Inga Paterno* has, so far as known, the record of altitude in Middle America, while *I. punctata* has the widest altitudinal distribution. Less than half the *Euinga-Sulcatæ* and all the *Pilosiusculæ* but one seem to prefer a temperate climate, while the rest are at home in the warmer belt or extend indifferently over both the lower and the inferior part of the Middle belt.

HABITAT, ASSOCIATIONS, HABIT

Several among the Middle-American species of Inga are known only under cultivation, and very little information has been collected as to their preferred habitat. As a general rule, they seem to thrive in rich, humid soil and moderately sheltered exposures. Some species, as *Inga spuria,* occur with frequence along large or small rivers, others (*I. punctata, laurina,* etc.) in light second growth groves, and others again (*I. oerstediana*) in clear spots of mountain forests. They do not as a rule form close associations, though in some cases considerable spots of an exclusive formation of *Inga spuria* or its affinities, have been observed around bogs or swampy places.

As to habit, several species are middle-sized trees, reaching sometimes (*I. punctata*) 15 to 18 meters in height, with a diameter of no less than 50 centimeters. Others, among which several forms or species of the group of *Inga spuria,* are mere bushy shrubs. When growing in close association with other forest trees, the shape of the crown is determined by the surroundings, but, in the open, a few species, like *I. laurina* and *I. punctata,* assume an elongated, broomlike shape, all the limbs forming an acute angle with the main axis. Other species, including all those of section *Diadema,* belong to the umbrella-shape type, with a short trunk and a single tier of

horizontal or drooping branches. Lastly, a goodly number of species have a rather long, straight trunk, with several tiers of horizontal limbs.

CULTIVATED SPECIES AND THEIR USES

Three of the Middle-American species of Inga are known only under cultivation or semi-cultivation, either in coffee or cacao plantations or as shade and fruit trees around houses. They are *Inga Jinicuil, I. Paterno* and *Inga radians.* The fact that two of them have old nahuatl names, *xinicuil* and *quautlxinicuil,* points to an economic importance of very ancient date; they can be associated with *Calospermum mammosum, Achras Sapota* and *Theobroma Cacao* as the oldest fruit trees of the Middle-American aborigenes. It is interesting to note that they all belong to one single section of the genus and that they are closely allied.

Among the other species, the following are known both wild and used as shade trees in semi-cultivated condition.

Inga laurina	*Inga punctata*
Inga brevipedicellata	*Inga Goldmanii*
Inga leptoloba	*Inga Rensoni*
Inga Preussii	*Inga edulis*
Inga Pittieri	*Inga oerstediana*
Inga Rodrigueziana	*Inga sciadodendron*

Among them, *I. Goldmanii* has come in general use in coffee and cacao plantations in Costa Rica in recent times. It was not even known specifically in 1890, and is actually commonly seen shading such plantations on the Atlantic slope of that country.

As explained in the introduction, the species of Inga have gradually superseded other trees originally used as shade-trees and windbreakers in coffee plantations. It is likely that the Ingas began to come into prominence in Costa Rica about 1890. Up to that time, the trees used more extensively were two small-sized species of *Erythrina* (*E. costaricensis, E. rubrinervia*), which, however, were objected to mainly on account of th danger of their prickles to the naked foot of the laborers, but also because, like all other species of the genus, they were despoiled of their foliage during the dry season. *Samanea,* which was at a time much in favor in Venezuela and other parts of South America, never was extensively used as a shade tree in Central America. On the Pacific watershed of Costa Rica, *Gliricidia sepium* was and is still the favorite in plantations situated below 1000 m., that is to say, at the lower edge of coffee cultiva-

tion; besides, it is often seen in the cacao plantations of the drier belt.

The Inga species have in their favor a permanent, not too thick foliage, a small size and a low branching which makes it possible to conveniently regulate and distribute the shade. Some species like *Inga Goldmanii, Rensoni, Preussii, Pittieri, rodrigueziana* and *edulis,* are given the preference in plantations located at low altitudes, while *I. laurina* (seldom used), *leptoloba, punctata* and *oerstediana* are used in the upper coffee-belt. Other species are met occasionally in the plantations. *Inga spuria* is avoided because short lived and subject to the attacks of insect pests.

It is possible that the role played by the Ingas as fruit trees has been underestimated; some of their larger pods with rich sweet pulp offer indeed real dietetic possibilities. All over Tropical America, these fruits are commonly seen in the markets and the fact that they have been used from the remotest antiquity as a food is also shown by their being found in Peruvian graves and by their having being reproduced in clay by the ancient pottery makers of South America[1]. The Venezuelan writer and traveler Michelena[2], celebrates in a few lines the exquisiteness of the *guamas* found by him in the village of Santa Isabel, on the Casiquiare, and describes the Inga tree in the middle of the plaza and the savorous pulp surrounding a single seed in a flat pod, etc. Such references are found in many other works and there are very encouraging reasons for paying more attention to this rather neglected fruit.

The pods of the following species are considered as edible in Central America:

Inga edulis *Inga spuria*	Pod of variable length (up to 1 m.) and thickness, terete, sulcate, twisted, not unlike a piece of rope.
Inga spectabilis	A very long and broad legume but rather flat, and with scarce pulp. Prized by the Bribri Indians of Costa Rica. Also cultivated in Panamá, where the pods are unusually long (up to 75 cm.) and broad.
Inga radians *Inga paterno*	The first species has large green pods in which the transversally placed seeds are surrounded by a copious aril. In the latter species, the pods are smaller. When in season, an important addition to the fruit market in Guatemala City.

[1] Safford—Proc. Nineteenth Congress of Americanists (December, 1915) p. 17. 1917.
[2] Michelena y Rojas—Exploración oficial etc. 1867—p. 354.

Inga punctata *Inga laurina* *Inga marginata* *Inga aestuariorum* *Inga ruiziana*	Small pods, with a more or less abundant and perhaps more palatable pulp.
Inga mucuna	Species with broad hairy pods, the pulp of which is relished by the Choco Indians of Panamá.
Inga rensoni	Hairy, broad pods, the sweet pulp of which is a favorite among the natives of San Salvador.

SPANISH VERNACULAR AND NATIVE NAMES

On account of the many errors in the identification of the species, and also of the general lack of discrimination in the use of common names, it is somewhat difficult to give a correct list of such names. In preparing the following list, I have had to reject practically half of the materials originally brought together. What is left may be considered as a rule to correspond to the right specific names. Because of the importance of several species of this interesting group as shade or fruit trees, it is to be hoped that a further effort will be made to eventually straighten and increase the list.

Inga Jinicuil Schlecht—MEXICO: *Jinicuil,* used in the area of dispersion of the species. The derivation seems to be from the nahualtl *xini*, to fall, to hang, and *quilitl*, a shoot, here by extension a pod, the meaning being therefore, (the tree with) hanging, pendent pods. *Cuajiniquil, cujiniquil* or *guajiniquil* (see below) is an ampliation, the prefix *cua* or *cu* corresponding to *quauitl*, a tree, thus: the tree with hanging pods.

Inga Paterno Harms—*Paterno*, o *paterna*, in GUATEMALA and SALVADOR, Etymology unknown.

Inga radians Pittier—*Cujiniquil* in Tapachula (Cook); *paterno* in Guatemala; *guavo real* in COSTA RICA, where the tree is sometimes cultivated, having been brought from Guatemala.

Inga marginata Willd—Sometimes *sotacaballo* in Costa Rica, where however this name applies more generally to *Pithecolobium cognatum*. It is the *buk-u-dra* of the Guaimi-Indians.

Inga laurina Willd—In the kekchi language of Alta Verapaz, the pods of this tree, as well as those of *I. leptopoda,* are called *butz-chachuk*, according to O. F. Cook.

Inga leptoloba Schlecht—See under *I. laurina* and *I. punctata.*

Inga punctata Willd—This species, as well as the anterior and several others, is known in Costa Rica under the generic name of *guavo*, which becomes *guamo* in NORTHERN SOUTH AMERICA.

This same species is also called *cuajiniquil blanco* and *ixcapirol* in Guatemala.

Inga ruiziana G. Don.—*Toparejo* in the Choco language of SOUTHERN PANAMÁ.

Inga Mucuna Walp. & Duch.—*Guavo peludo* in PANAMÁ, a name applied in that country and Costa Rica to all the species with broad hairy pods. *I. Mucuna* is also the *mimi-sajo* or *mimi-sojo* of the Choco Indians.

Inga spectabilis Willd.—*Guavo machete* in COSTA RICA, on account of the likeness, in size and shape, with the sheathed bush-knife in common use among the natives. It is also the *guavo real* of Panamá. In Bribri *se-ui*, in Térraba *u-gruók*, in Brunka *guarogua*, in Dorasque *suliapó*, in Guaimi *buk-e-kré*.

Inga Rensoni Pittier—*Qu'jinicuil* or *cujin* in SAN SALVADOR (Renson).

Inga Preussii Harms—*Cuxiniquil* (Preuss); *nacaspil* (Pittier) in SAN SALVADOR. *Cuxiniquil* is the pipil form, much closer to the original nahuatl; *nacaspil* is also of pure Mexican derivation and may be misapplied here, if the meaning is *nacas*, ear, with the diminutive suffix *pil*.

Inga Rodrigueziana Pittier—*Chalun colorado* in Chiapas, MEXICO according to Popenoe. The name *chalahuitl* for *I. spuria*, seems to indicate that *chalun* is also of nahuatl derivation.

Inga edulis Mart.—The BRAZILIAN name of this species, *Inga cipo*, is the origin of the generic name used in scientific classification. It is the *guavo-bejuco*, or *guavo torcido*, so-called on account of its long, twisted pods, of several parts of Southern Central America, and the *guavo mecate of* Mexico. *Suremná, se-ui* in Térraba; *tseuib-ua* in Brunka.

Inga oerstediana Benth.—*Guavo* in WESTERN PANAMÁ.

Inga spuria Humb & Bonpl.—SOUTH-MEXICO: *vainillo* (Kerber); *chalahuitl* (Pringle). Guatemala; (Heyde & Lux); Costa Rica, *cuajiniquil* (Pittier); *ataña* in Bribri, *xuín* in Térraba, *brudji-ua* o *vainica* in Brunka (Pittier), *buk-óro-mo* in Guaimi.

Inga eriocarpa Benth.—MEXICO; *bainillo, vainillo* (Langlassé).

Inga xalapensis Benth.—MEXICO: *cuajiniquil* (Jalisco, Safford).

Inga Sciadodendron—Harms—MEXICO: *chalauitl* (Veracruz, Purpus).

Inga oophylla Riley—*Vainillo* (Sinaloa, González).

Inga fissicalyx Pittier — MEXICO; *Bitz, chelele, guatope* (Tabasco, Rovirosa).

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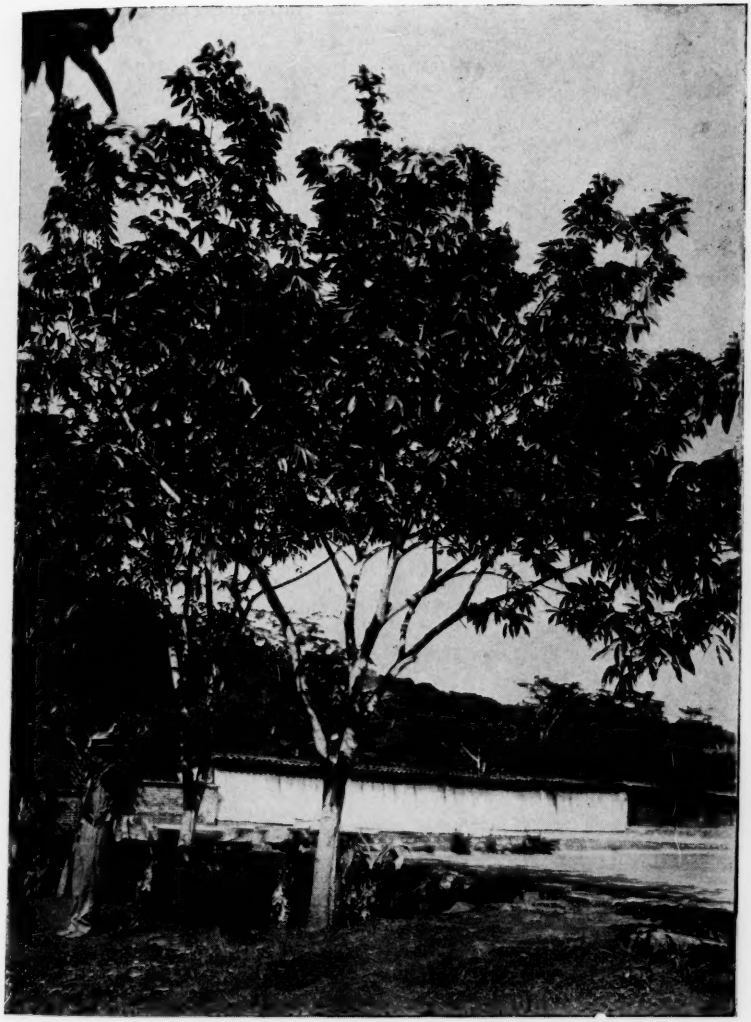

INGA PATERNO HARMS. A TREE NEAR SAN JOSE, COSTA RICA.
COOK & DOYLE No. 15. (PHOTO. BY G. N. COLLINS.)

INGA
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PLATE XIV.

INGA PATERNO HARMS. INFLORESCENCE AND LEAVES. SAN JOSE, COSTA RICA. COOK & DOYLE No. 15. (PHOTO BY G. N. COLLINS.)

INGA RADIANS PITTIER. A TREE IN TAPACHULA, CHIAPAS, MEXICO. (O. F. COOK 805)
PHOTO. BY G. N. COLLINS.

PLATE XV.

INGA RADIANS PITTIER. INFLORESCENCES AND LEAVES. (O. F. COOK No. 805.)
(PHOTO. BY G. N. COLLINS.)

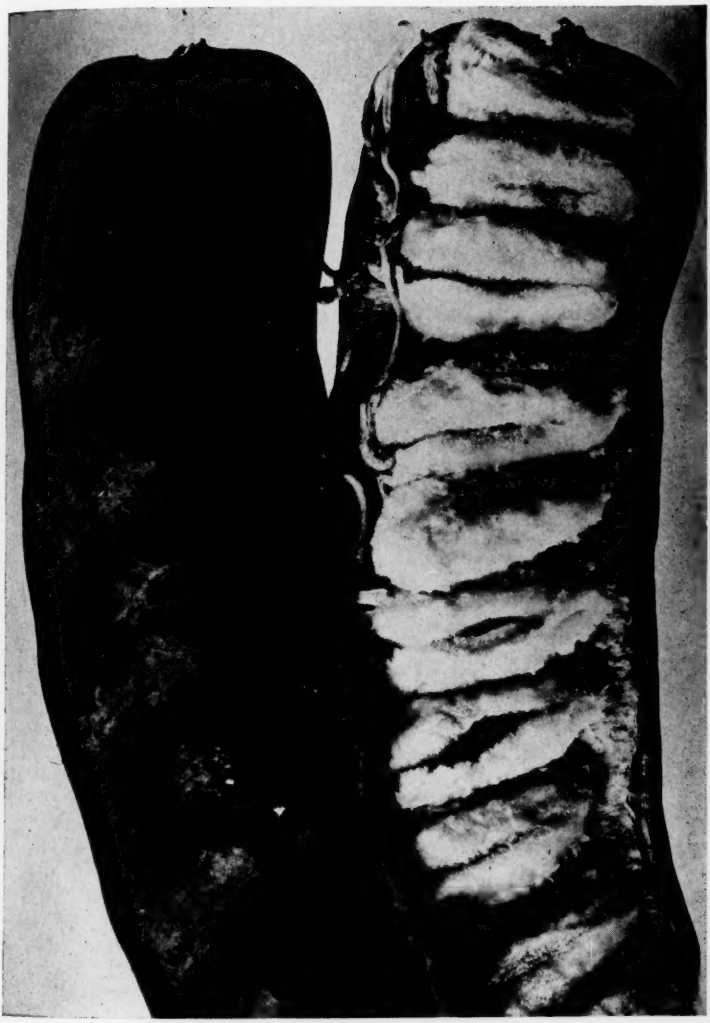
PLATE XVI.

PLATE XVII.

INGA RADIANS PITTIER. PODS, FRONT AND PROFILE. TAPACHULA, CHIAPAS, MEXICO. (PHOTO. BY G. N. COLLINS.)

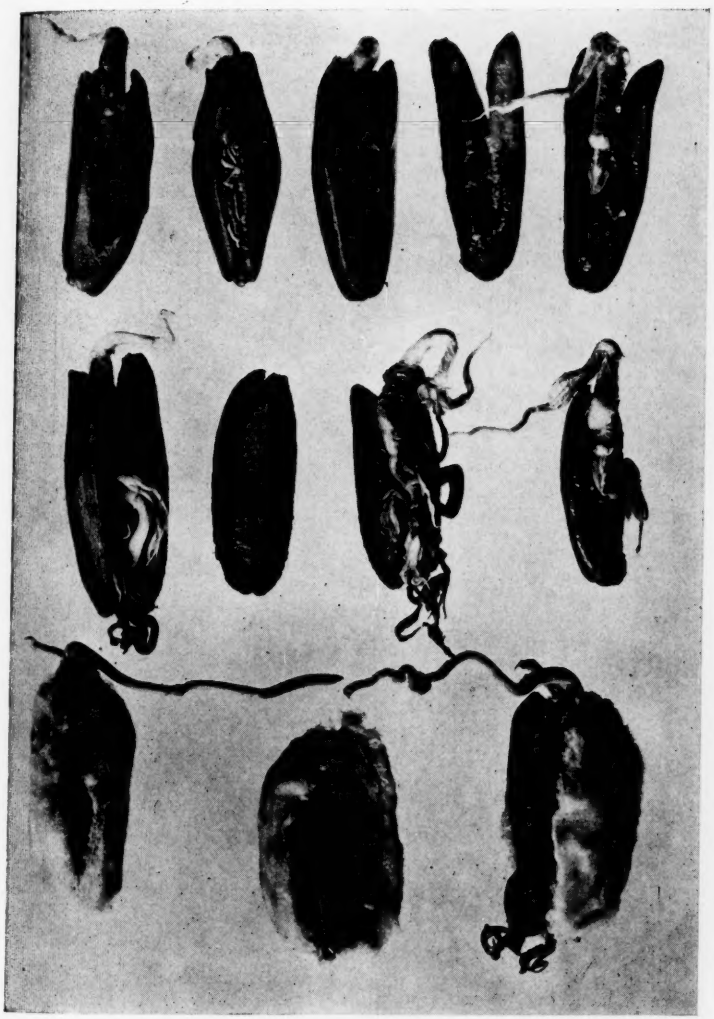
INGA

PLATE XVIII.



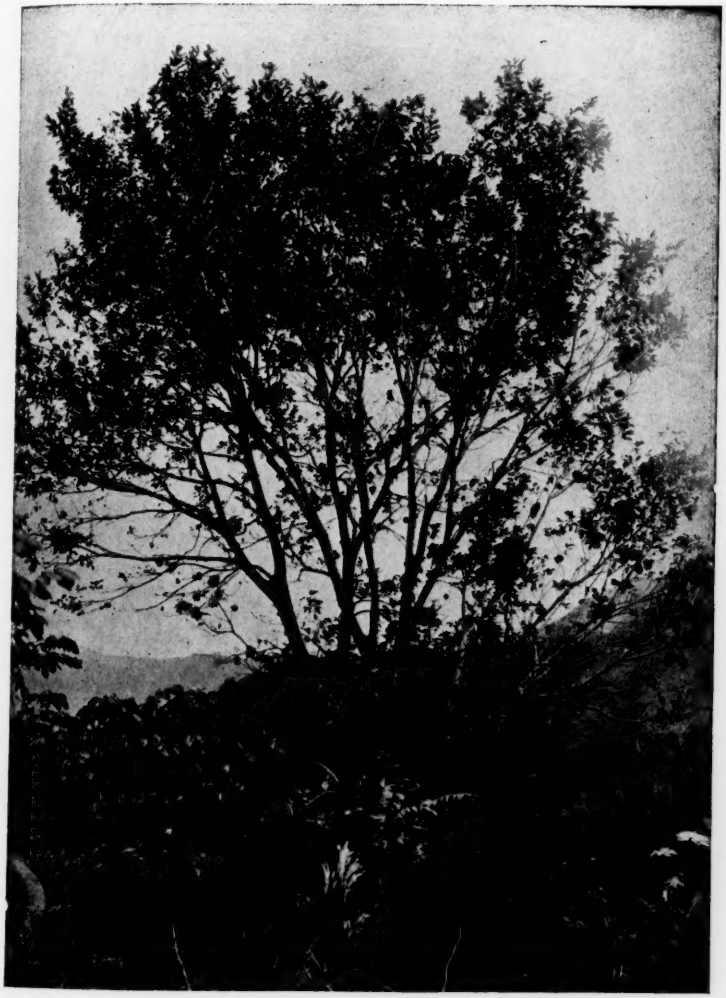
INGA RADIANS PITTIER. POD OPEN AND SHOWING WHITE PULP AROUND THE SUDS. TAPACHULA, CHIAPAS, MEXICO. (PHOTO. BY G. N. COLLINS.)

PLATE XIX.



INGA RADIANS PITTIER. GERMINATING SEEDS. TAPACHULA, CHIAPAS, MEXICO. (PHOTO. BY G. N. COLLINS.)

PLATE XX.



INGA LAURINA WILLD. A TREE IN COFFEE PLANTATION, PORTO RICO.

INGA LAURINA WILLD. FLOWERS, LEAVES, YOUNG POD AND NODULES ON THE ROTLETS. NATURAL SIZE. PORTO RICO. (PHOTO. BY G. N. COLLINS.)

PLATE XXI.

INGA LAURINA WILLD. LEAVES AND NATURE PODS. PORTO RICO.
(PHOTO. BY G. N. COLLINS.)

PLATE XXII.

PLATE XXIII.

INGA LEPTOLOBA SCHLECHT. FIRST STAGE OF FLOWERING; SHOWING ALSO NEXTARY GLANDS AND DETAILS OF LEAF. N. S. FROM COOK & GRIGGS SPECIMEN No. 51, ALTA VERAPAZ. (PHOTO. BY G. N. COLLINS.)

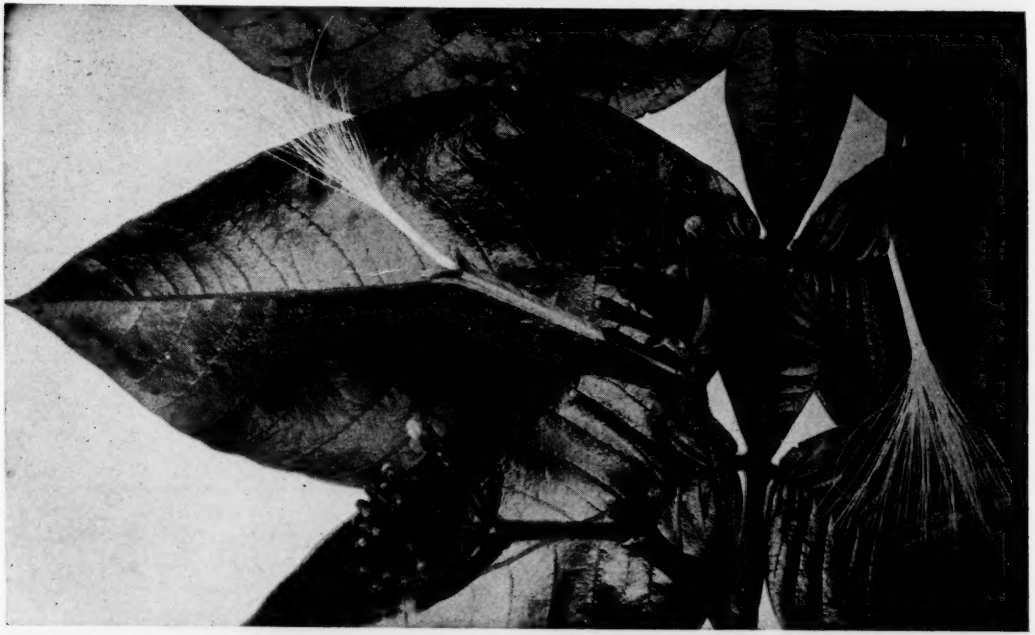
PLATE XXIV.

INGA LEPTOLOBA SCHLECHT. ADVANCED STAGE OF FLOWERING.
FROM COOK & GRIGGS SPECIMEN No. 53, ALTA VERAPAZ.
(PHOTO. BY G. N. COLLINS.)

IN

PLATE XXV.

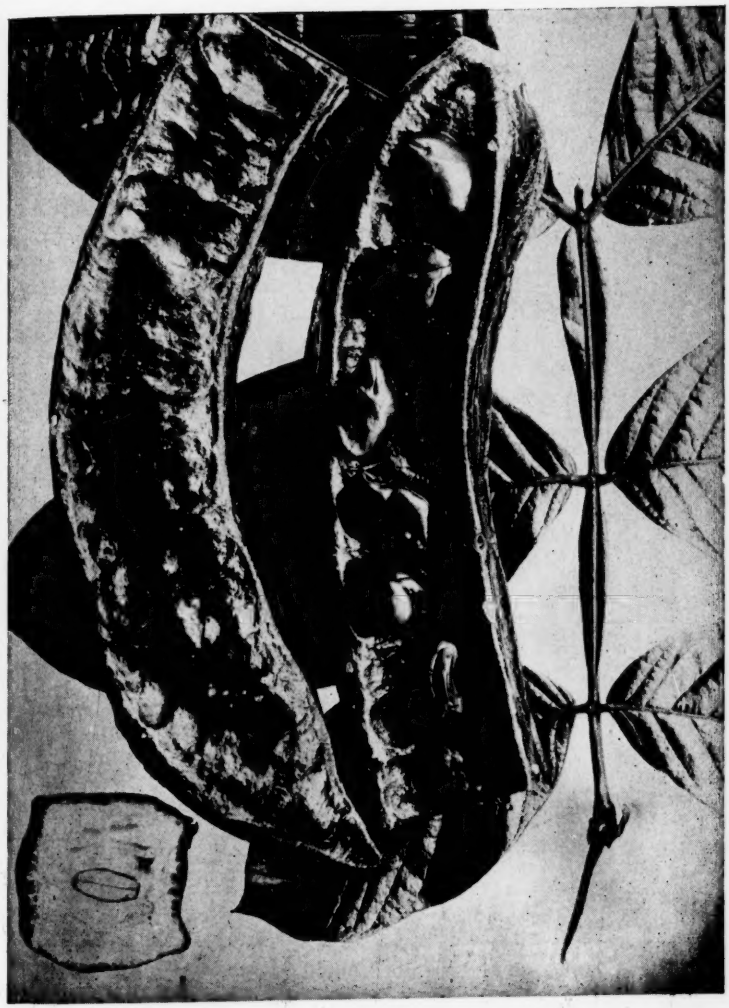
INGA LEPTOLOBA SCHLECHT. FULL BLOOM WITH PART OF LEAF SHOWING GLAND IN UPPER LEFT CORNER. FROM COOK & COLLINS SPECIMEN No. 53. ALTA VERAPAZ. (PHOTO. BY G. N. COLLINS.)



INGA MUCUNA WALP. & DUCHASS. FLOWERS AND LEAFLETS. FROM PITTIER'S SPECIMEN No. 5525. SOUTHERN PANAMA. (PHOTO. BY H. PITTIER.)

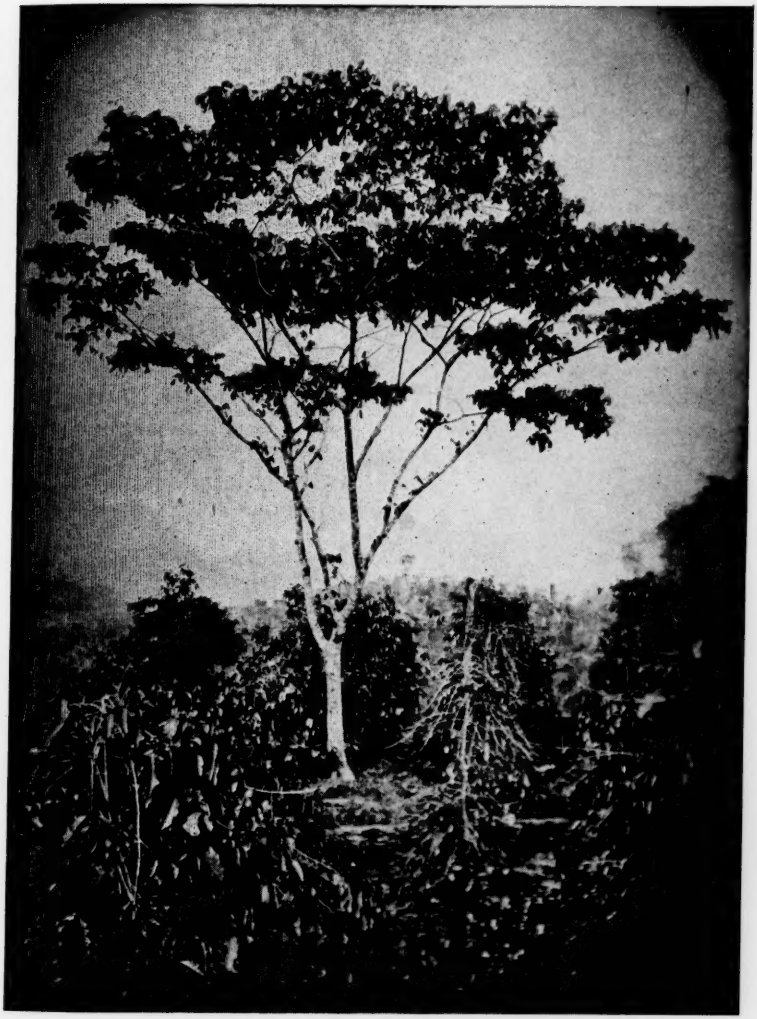
PLATE XXVI.

PLATE XXVII.



INGA PREUSSU HARMS. POD AND LEAF. LA CONCEPCION, GUATEMALA. (PHOTO BY G. N. COLLINS.)

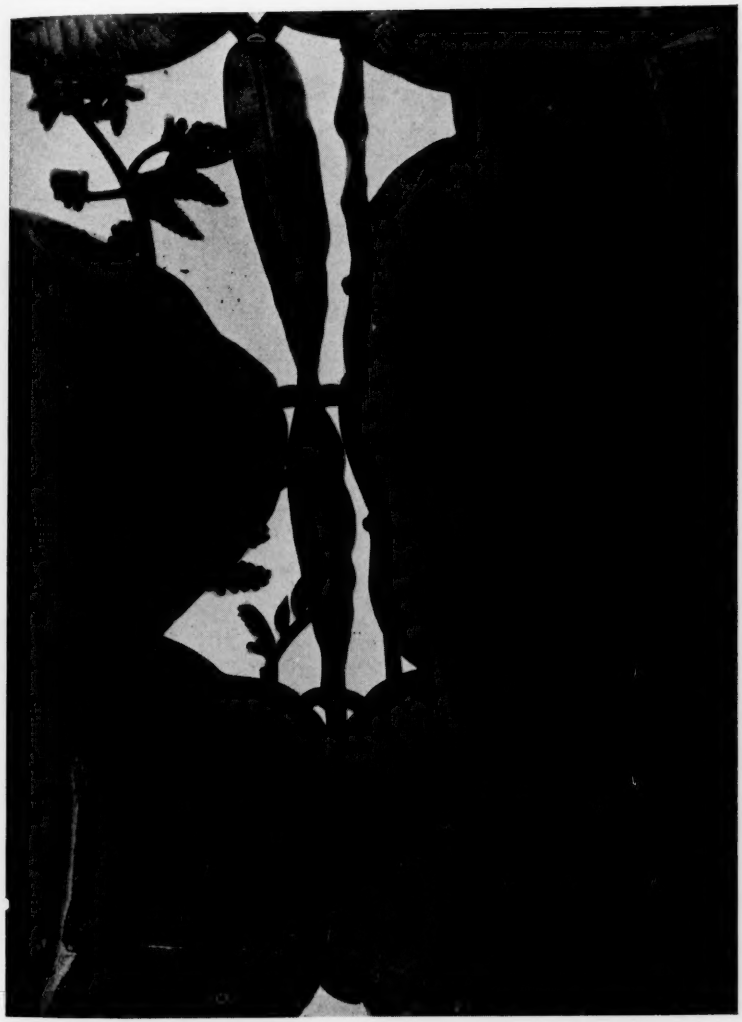
PLATE XXVIII.



INGA EDULIS MART. A TREE IN COFFEE PLANTATION AT SEPACUITÉ, GUATEMALA. (PHOTO. BY G. N. COLLINS.)

IN

PLATE XXIX.



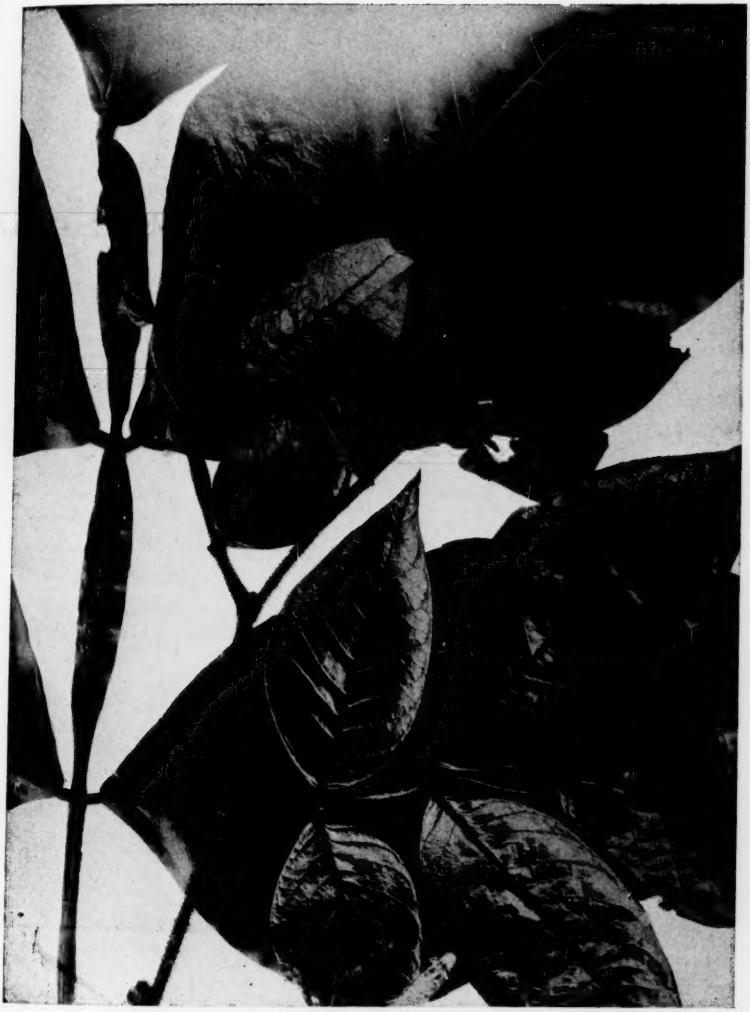
INGA EDULIS MART. LEAVES SHOWING NECTARY GLANDS AND INFLORESCENCES IN PREFLOWERING STAGE. FROM COOK'S SPECIMEN No. 124 COLL. AT SEPACUITÉ, GUATEMALA. (PHOTO. BY G. N. COLLINS.)

ING

PLATE XXX.

INGA EDULIS MART. FLOWERING BLANCHLET AND LEAF. COOK & GRIGGS SPECIMEN No. 228, SEPACUITÉ, GUATEMALA. (PHOTO. BY G. N. COLLINS.)

PLATE XXXI.



INGA COOKII PITTIER IN FOREGROUND. COOK & GRIGGS No. 226; INGA EDULIS MART. IN BACKGROUND, BUT SPECIMEN APPARENTLY NOT IN HERBARIUM. BOTH FROM SEPACUITÉ, GUATEMALA.